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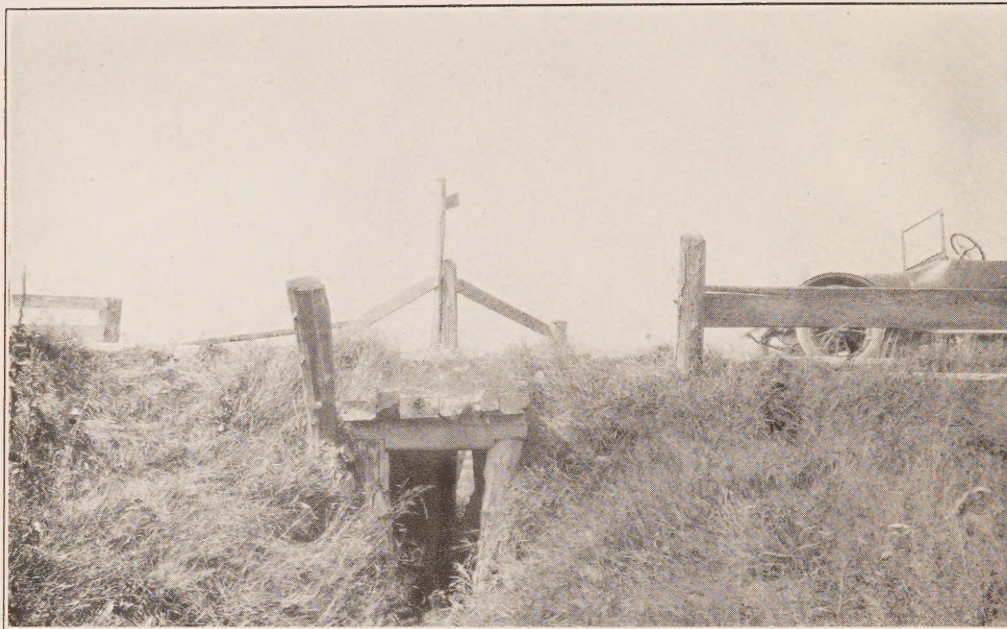


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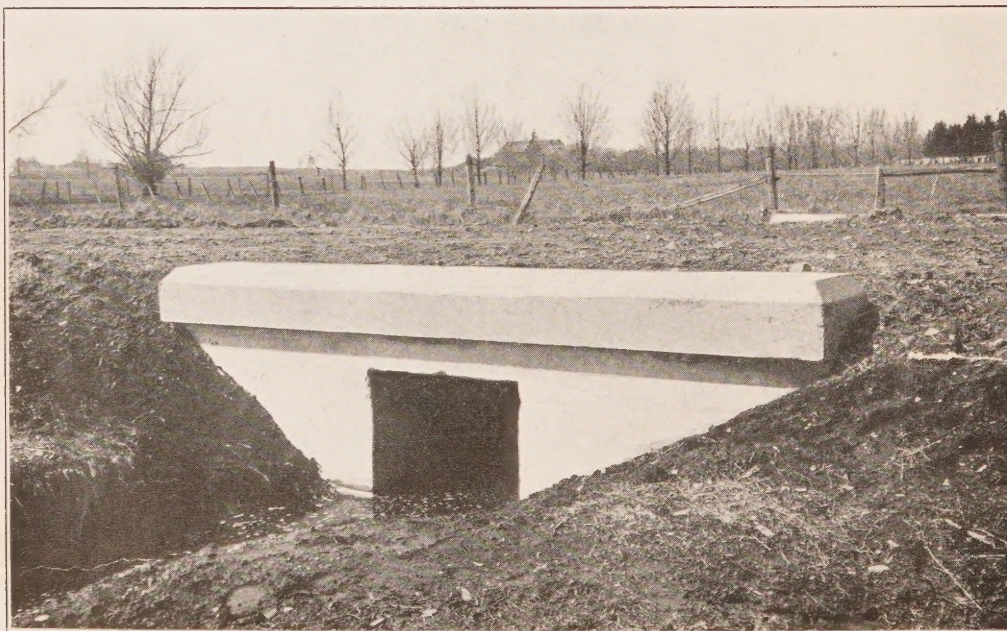
Ontario. Highway dept
Report



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THE OLD.
Culvert on the Provincial Highway in Pickering Township.



THE NEW.
Replacing the old culvert on the Provincial Highway.

Ontario Highways, Department of
Annual Report

ANNUAL REPORT

OF THE

Department of Public Highways

ONTARIO

1917-27

PRINTED BY ORDER OF
THE LEGISLATIVE ASSEMBLY OF ONTARIO



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To His Honour SIR JOHN STRATHEARN HENDRIE, K.C.M.G., C.V.O., a Colonel
in the Militia of Canada, etc., etc.

Lieutenant-Governor of the Province of Ontario.

MAY IT PLEASE YOUR HONOUR:

I herewith beg to present for your consideration the annual report of the
Department of Public Highways, relating to Highway Improvement in the Pro-
vince of Ontario.

Respectfully submitted,

F. G. MACDIARMID,

Minister of Public Works and Highways.

To the Honourable F. G. MACDIARMID,

Minister of Public Works and Highways.

SIR,—I have the honour to submit the annual report of the Department of Public Highways, having special reference to work carried on by the several counties of Ontario under the *Act to Aid in the Improvement of Public Highways*, and subsidized by the Province. Accompanying this report are a series of appendices with respect to various phases of road and street construction and maintenance, and traffic conditions.

I have the honour to be,

Sir,

Your obedient servant,

W. A. McLEAN,

Deputy Minister of Highways.

Parliament Buildings, Toronto.
February 26th, 1918.

ANNUAL REPORT OF THE Department of Public Highways

W. A. McLean, Deputy Minister

Road improvement was materially affected by war conditions during the year 1917, more especially by the scarcity of labour, high wages, and lack of railway service for the transportation of materials. Financial conditions have not been entirely unfavourable, particularly on the part of the rural municipalities; but road work has been largely restricted to that which could be carried on with expenditure available from revenue, and bond flotations for this purpose have been very limited in number and amounts. Labour has not, in some localities, been obtainable for the proper maintenance of roads already constructed.

Unnecessary labour of all kinds, and unnecessary expenditure should undoubtedly be avoided in time of war, not merely on the part of national and municipal governments, but also by the individual citizen. Acting on this general principle, the Department of Public Highways has not encouraged road construction or expenditure except where dictated by needs of efficiency and economy. It is recognized, however, that the waste of time in transporting goods or in driving over bad roads is very great; that much inefficiency is created by bad roads; and that because of bad roads farm produce is frequently lost or much depreciated by inability to place it on the market. Road construction, rightly applied, is a useful war measure. Reasons of efficiency in transportation render it expedient that certain roads should be built even in war-time; but more important, that others already improved, should be properly maintained.

Road maintenance means very largely that a limited amount of time and effort are expended on the repair and improvement of roads in order that a comparatively great amount of time and energy may be saved in travel and transportation over them; in order that still other traffic which would have to take less economical routes will follow the improved road; and in order that still other traffic which would not exist, may be created and developed. Good roads, desirable as a matter of efficiency in time of peace, are much more necessary in time of war, when economy of men, money and labour is urgent. While the extensive construction of new roads may not be a saving in man-power within the period of the war, the better maintenance of existing roads is undoubtedly a profitable war measure. The strategy of war is largely a problem in roads; and that principle, rightly understood, extends in some degree to the remote points of production throughout the Empire.

The efforts of the Department of Public Highways have been energetically devoted to organization for road development after the war, in order that this important public work may be utilized as far as possible in the adjustment of after-the-war problems. To this end surveys are being made for Provincial work, municipal organization has been encouraged, and it is anticipated that rapid progress will be made at the close of the war in meeting the needs and opportunities of better roads.

Matters of recent importance in relation to roads in Ontario, and deserving of special record include:—

1. The enactment of the Provincial Highways Act, and the creation of a first section of the Provincial Highway, being that portion of the Kingston Road from York County to Port Hope.

2. The adoption of County Road Systems by all but one county in the Province.

3. The completion of an excellent concrete highway between Toronto and Hamilton, a distance of 35.8 miles, under the management of a special commission appointed for that purpose in 1914.

I.

COUNTY ROADS AS A WAR MEASURE

A class of roads which are of special value for efficient transportation are those radiating from cities, towns, and shipping points; for it is on these that traffic accumulates, and their improvement will bring the greatest service to the greatest number. As shown by traffic charts contained in the Annual Report of this Department for 1915, these constitute about 20 per cent. of the roads of the Province, and will carry about 80 per cent. of the traffic. The substantial improvement of such roads, or a portion of them, and their maintenance no doubt falls within the definition of justifiable war measures.

The County Road System, through which Provincial subsidies are given to road improvement, is an important means of classifying the roads, setting apart the more heavily travelled market roads for first attention, and thereby limiting the tendency to dissipate municipal expenditure in disconnected works, and on roads carrying comparatively little traffic. Through this system, machinery can be more readily applied to the work, thereby displacing much of the manual labour and teams otherwise required, and producing better and more economical results.

County road systems not only tend to efficiency and economy under war conditions, but will also play an important part during the period of readjustment following the war, when unemployment may result, unless adequate preparation is made to meet all possible contingencies of industrial and commercial reaction.

New County Road Systems in 1917

A special effort was made during the year to bring the advantages of County Road organization before all counties which had not previously adopted the system, with the result that the necessary by-laws were passed by the Councils of the United Counties of Dundas, Stormont and Glengarry, and the Councils of Essex, Brant, Victoria, Elgin, Kent, Huron, Bruce, Grey, Norfolk, Ontario, Renfrew, Dufferin, Lambton and the United Counties of Northumberland and Durham. Thus only one County Council, that of Peterborough, has not yet adopted a county road system. Out of thirty-seven organized counties, thirty-six have passed the necessary by-laws, under which 9,200 miles of road have been assumed for construction and maintenance, and of which since the passing of the Act, 2,325 miles have been substantially improved to the end of the year 1917.

County Road Construction in 1916

Complete returns of county road work in 1916, upon which subsidies have been paid, show a total outlay of \$955,447.15, of which \$684,501.20 was for

construction and \$273,474.56 was for maintenance; the total amount of the Provincial grant being \$327,663.76. The work included the following:—

Miles of road metalled with broken stone	63.42
Miles of road metalled with gravel	79.66
<hr/>	
Total mileage of surfaced road	143.08
Miles of road graded only	41.88
Number of bridges constructed	46
Number of culverts	608

County Road Construction in 1917

Returns of county road work in 1917, upon which subsidies have been paid, show a total outlay of \$1,388,341.87, of which \$1,006,814.80 was for construction, and \$381,527.07 was for maintenance; the total amount of the Provincial grant being \$483,621.32.

The work included the following:—

Miles of road metalled with broken stone	70.41
Miles of road metalled with gravel	79.05
<hr/>	
Total mileage of surfaced road	149.46
Miles of road graded only	104.70
Number of bridges constructed	75
Number of culverts	556

Fuller details of the expenditure in each county will be found in Appendices A and B of this report; and in the reports of the inspecting engineers with regard to each county organization.

II.

SUBURBAN ROAD SYSTEMS

The increased carrying capacity and utility of main roads due to the use of motor vehicles for passengers and freight, have greatly increased the direct value to cities of main country roads. The advantages of good roads in relation to national and community development have been generally accepted in the past, but not to the extent which now marks the situation.

The urgency with which cities have desired the improvement of the main roads of the Province has also suggested, in a marked degree, the benefit which such main roads are to urban centres. Recent highway laws of the Province recognize this important principle, and provide organization whereby cities may contribute directly to the construction and maintenance of main roads adjacent to and radiating from them.

The tendency of municipal organization in the past has been to encourage each local municipality in the belief that it should be responsible solely for the roads within its boundaries, as a city, town, village or township; and has failed to recognize sufficiently the community of interest, obligation, and opportunity for betterment involved in county organization. So far has this spirit existed in Ontario that cities of the Province, upon incorporation, have been automatically separated from county organization, thereby becoming relieved from their obliga-

tions with respect to the development of the larger community in which they are located. County organization is a means of uniting the common interests of a series of local municipalities under one body, the County Council. Under these circumstances a readjustment has become necessary, for which purpose "Suburban Road Systems" were authorized under the Ontario Highways Act, thereby seeking to expand the usefulness of the Ontario municipal system by linking up cities with county organization in a slight degree.

Suburban Road Commissions have been organized with respect to the cities of Toronto, Kingston, Guelph, Galt, Kitchener, Hamilton, Brantford, St. Catharines, London, Windsor, and the Town of Smith's Falls, while the matter is in process of negotiation with respect to others. A Board of Commissioners is composed of



A LOG DRAG.

In use on a gravelled section of the Provincial Highway.

three members in the case of a city of less than 50,000 population; and five members when the city has a population of more than 50,000. The county and city are equally represented on the Board, which designates the roads to be improved, determines the expenditure to be made each year, and has oversight of the work.

The demand upon the city cannot exceed one-half mill annually for construction, but it is generally understood that the expenditure under these commissions will, as a rule, be limited during the war to maintenance and development work of more urgent character.

The Provincial subsidy to the work of suburban commissions is the same as for county roads; viz., 40 per cent. for construction and 20 per cent. for maintenance. But the joint contributions of city and county are expected to be double that of the county alone, so that the Provincial subsidy is proportionately greater, and a more substantial type of improvement becomes possible by such united

effort. In this way provision will be made for the heavier traffic adjacent to cities, demanding the more expensive types of construction, and more constant maintenance.

III.

THE PROVINCIAL HIGHWAY

The first section of the Provincial Highway System as authorized by the Provincial Highway Act, was taken over by this Department on August 21st, 1917, in accordance with an Order-in-Council dated July 25th, 1917, and of which statutory notice was duly given to the several municipalities affected, and in the *Ontario Gazette* of July 28th, 1917.



AFTER DRAGGING.

A newly gravelled section of the Provincial Highway, with material kept in place by use of the log drag.

This portion of the proposed Provincial Highway System consists of what is locally known as the Kingston Road. It extends from the easterly boundary of York County at the River Rouge to the Town of Port Hope, a distance of 45.7 miles. Portions of this road within the incorporated Towns of Whitby, Oshawa, Bowmanville and Newcastle are permitted to remain under the local authorities. The length of the road actually assumed to date by the Province is, therefore, 38.07 miles within the Counties of Ontario and Durham. As that portion of the Kingston Road within York County from Toronto to the River Rouge is now under the York and Toronto Road System, the Kingston Road from Toronto to Port Hope, a distance of 56.1 miles, is thus designated for improvement and systematic maintenance.

Provincial highways, such as proposed in Ontario, are not intended as a means

of constructing an extravagant system of pavements at great expense—but rather as a means of economy, and of more equitable distribution of the cost. The organization is intended for roads carrying heavy international, and heavy interurban traffic, such as local municipalities cannot be expected to provide for. As this heavy traffic is that of motor vehicles it is but just that the Provincial contribution should be made from the motor vehicle fund. As with county roads, a plan of efficient maintenance and gradual development can be applied, the work being paid for from annual revenue. When traffic becomes so great at any point that maintenance of the existing type of road is no longer economical, a more permanent surface can be laid—but the foundation work of widening, grading, drainage, culverts, etc., will be already in place—and paid for.

The report of the Chief Engineer of the Department, with respect to work on the Provincial Highway from York County to Port Hope will be found in Appendix D. While labour conditions, the rate of wages, and cost of materials were unfavourable, the state of the road was such that a very marked improvement has been made in its condition.

IV.

MOTOR VEHICLE TRAFFIC

Roads are built for traffic. The cost of roads and also the public value of roads, increases in proportion to the traffic over them. The growing value of the public highway is reflected by the increasing number of motor cars owned in the Province.

The motor vehicle registration in 1917 consisted of 78,861 passenger cars, and 4,929 commercial vehicles, a total registration of 83,790 motor vehicles. This is an increase of 29,415 over 1916, and is nearly twice the registration of 1915. Since the year 1911, the registration has approximately doubled every second year; thus registration of 1913 was twice that of 1911, and the registration of 1914, nearly double that of 1912. While this rate of progress cannot continue indefinitely, there is still much room for growth. There is now in Ontario one car for each 39 of population; the average in the United States is one for each 20 of population. The greatest number in proportion to population is in the State of Iowa, where there is one car to each 9 of population. The agricultural states, rather than manufacturing, contain the greatest number of cars in proportion to population. This is true among the provinces of Canada, and in Saskatchewan there is a registration of one car to each 12 of population. In Ontario, the registration shows that 23,409 cars are owned by farmers, an increase of 11,835 in 1917.

Revenue from Motor Vehicles

The proposal has been made from time to time that all or a part of the revenue from motor vehicle registration might be returned to the local municipalities from which it is derived. To this there are, on grounds of efficiency and equity, important objections:

The registration of motor cars is necessarily a function of the Provincial Government; since, for purposes of law enforcement, it is essential that all cars be registered in a central department. The Province thus relieves municipalities from the responsibility and expense of registration; and the registration fees are primarily indicated as a source of Provincial revenue. Municipalities receive all fines imposed, through their constables, under the Motor Vehicles Act.

The fees for motor car registration were advanced in 1916, in order that a substantial Provincial fund would be created for road improvement. Motorists were informed when this increase was made that the purpose was to provide for road betterment. It is therefore incumbent upon the Provincial authorities to see that this money is applied to substantial road improvement; and is not spent inefficiently or merely returned to local municipalities to enable them to reduce the local tax rate.

The road laws providing Provincial aid to road construction have been placed by the Government on their present broad and effective basis, in the belief that revenue from motor vehicle licenses would form a permanent fund for Provincial co-operation in road improvement. If this revenue is to be lessened, Provincial expenditure on roads will necessarily be decreased, or placed on a less sound financial basis, to the public detriment.

It is characteristic of the motor car that its use is not confined to the municipality in which it is owned. The result is that cars owned in the cities of the Province are used freely on all rural roads; and the demand for the improvement of rural roads is as urgent from the cities as it is from the townships.

If motor car fees were returned to the municipality in which the car is owned, monies received from city-owned cars would also be returned to cities, instead of becoming available for use on main country roads, the improvement of which, as previously stated, is largely urged by residents of the cities.

Cities should contribute to the construction of main roads. This has been done, directly or indirectly, by every country which has built up an adequate system of leading roads. In no other way can it be accomplished in the Province of Ontario. The expenditure of motor vehicle fees on rural roads is but a small levy upon cities for this purpose, and is still far from meeting the obligation of cities to this work. To return motor vehicle fees to the cities would be to still further weaken the needs of municipal organization of Ontario, in a particular in which it is already defective, viz., the municipal separation of cities from the township and county in which they are located.

Under the existing highway laws of Ontario, the fund collected from automobile registration is now largely the basis of Provincial grants for road purposes, and it is returned to municipalities for expenditure on county roads under the Highway Improvement Act; or is spent in other ways on main roads in the open country which are subjected to heavy motor traffic, and which the local municipalities could not be expected to maintain. Thus motorists contribute directly to the improvement of the roads they wear out.

County roads are merely the leading township roads; and they are not of less service to township ratepayers because they are under the control of County Councils. The Provincial aid given to roads is, therefore, a method of giving the best and most effective form of aid to township roads.

The great need of Ontario has been, and still is, the greater concentration of funds in road construction. Past inefficiency in road management throughout the Province, which permitted the roads to remain in an inferior condition, has been largely due to the policy of scattered expenditure followed by township councils. Under township management, coupled with statute labour, practically no roads were "built." They were merely carried along from year to year by a method of patchwork, which produced no permanent results. A continuous mile of good road, except under favourable conditions of drainage and materials, was the exception, not the rule.

Expenditure was made in small amounts, with the object of making the greatest temporary showing. The roads lacked foundation and body to support traffic under wet conditions of autumn and spring, and "broke up" annually. Expenditure which does not produce roads that will not "break up" during the wet seasons is, as a rule, wasteful. One rope that will sustain a weight is infinitely more economical than innumerable threads that are broken as often as the weight can be attached.

"In union there is strength" is a truism in its application to concentrated expenditure on roads. One road with twelve inches of metal which will not break up, is vastly more economical than a dozen roads with four inches of metal, but which break up annually, and are never in a good condition.



COMPLETED ASPHALTIC CONCRETE SURFACE.
Dundas Street, County of York.

Briefly, roads must be built in proportion to the traffic over them. Roads of heaviest traffic are those radiating from market towns and shipping points, and included in county road systems; or roads joining up leading cities with the international and interprovincial boundaries, and to be classed as Provincial Highways. These are the roads of concentrated motor traffic, the roads which are most expensive to build and maintain, the roads which local municipalities are unable to keep in repair, nor is it equitable that they should do so. These are the roads to which motor vehicle revenue should and is being directed under the existing highway laws of the Province.

Any system which results in the diffusion of this revenue on roads of minor importance, would defeat a fundamental need of existing conditions in the Province.

V.

COUNTY ROAD ORGANIZATION

County Councils, in adopting road systems at the present time, have wisely taken this step in order that they may be prepared to cope with a possible period of depression and reaction after the war, and also that more efficient maintenance may be immediately applied to existing roads. A brief outline of some of the measures which should be taken may therefore serve a useful purpose at this time.

The County Road Superintendent

The first essential is the selection of a capable County Road Superintendent. He should primarily be a thoroughly practical man, energetic and experienced



SCARIFYING OLD MACADAM.

An attachment to the rear of the roller, loosening the old broken stone roadbed, preparatory to re-shaping and surfacing with asphaltic concrete. On Dundas Street, County of York.

in the handling of men. A man with the capacity of a thoroughly efficient contractor's foreman should be looked for. He should give all his time to the work, and by his growing experience will become increasingly valuable to the county. He should have sufficient education to keep the accounts and make the reports required by the county council and this Department. He should be a man of sound judgment, self-reliant, and with sufficient confidence in himself to accept full responsibility for carrying on the work. The success of the county road system will depend upon the selection of the County Road Superintendent more than on any other factor, and the choice of a capable man for this position is one of the most important duties of a county council.

Work to be Done

In carrying on the maintenance and repair of the system of roads assumed, the object should be to put the entire mileage into a reasonably good condition for traffic with the least possible delay, and to keep it in that state. In doing this, four classes of work will present themselves:—

- (1) The improvement and maintenance of old gravel roads.
- (2) The grading, draining, and substantial improvement of earth roads.
- (3) The subsequent maintenance of earth roads.
- (4) The construction of small bridges and culverts.

Grading Outfits

The organization of sufficient grading outfits is advisable, consisting of a grader, tractor, heavy plough, and sufficient men and teams for operation. Each of these outfits should be under a foreman appointed by the County Road Superintendent; should work continuously throughout the year until all roads have been gone over; and thereafter they should continue on special works of improvement in preparation for substantial surfacing and construction.

Gravel roads should have the edges and shoulders cut off, and turned outwards; the centre of the road to be lightly surfaced and levelled with gravel as occasion may require.

The earth roads should be well outlined and shaped, giving them sufficient drainage.

This work with the grading outfits will take care (1) of the improvement and maintenance of old gravel roads, and (2) of the more complete improvement of earth roads.

Repair of Earth Roads

When earth roads have been well graded, it is desirable that they be maintained in that condition. The use of the log drag or small steel scraper is very effective. One of the most successful counties in this regard is Essex, where the earth roads have been divided into sections about four miles in length; each section is placed under an overseer, usually a farmer residing alongside the road, whose duty it is to drag or scrape the road as frequently as may be necessary, especially after rain when the soil is in a suitable condition to work. An investigation of results in Essex will repay the majority of counties now operating under the Act, especially those just entering the system and having a considerable mileage of earth roads to maintain.

Snow Removal and Emergency Repairs

Local overseers should be selected for all roads, preferably responsible farmers directly interested in and driving over the roads under their observation. It should be the duty of these men to drag the section of road allocated to them, if the road is such as to require this form of maintenance. They should be required to keep the snow roads open in winter, reporting the work as soon as started to the County Superintendent. They should report the need of minor repairs from time to time to the County Road Superintendent; or take immediate action to protect the road in case of a washout or other emergency.

Small Culverts and Bridges

It is generally found that when a system of county roads is taken over, there are numerous small culverts and bridges to construct, usually of concrete.

The County Road Superintendent may find it desirable to lay out a series of these for immediate construction, and a special gang under a foreman may be organized for this work. Larger structures may be constructed by contract as circumstances may render expedient. These are details for the County Road Superintendent to work out in consultation with the county engineer and road committee of the county council.

The Council and Road Committee

The Road Superintendent is primarily an officer of the county council, and general instruction may from time to time be given by that body.

At all times, the County Road Superintendent should be under the direction of the county road committee, with whom he should consult, and from whom more specific instructions may from time to time be received. Co-operation with the committee applies especially to the payment of accounts, and the following system is approved by this Department:—

(1) All accounts to be submitted in first instance to the Road Superintendent.

(2) Accounts to be checked by the Road Superintendent, approved, and forwarded to the county road committee; duplicates of accounts may be retained by the Superintendent if desired.

(3) In order to simplify the Treasurer's work, all accounts to be listed by the Road Superintendent on a distribution sheet which should form a summary of each batch of accounts, and be attached thereto before being forwarded to the county road committee.

(4) Accounts to be checked, payment authorized by the road committee, and accounts forwarded to the County Treasurer.

(5) Payment to be made by the Treasurer, and original accounts filed in his office.

(6) All accounts to be audited by the County Auditor.

(7) County road accounts to be closed on or before December 31st, in order that the audited accounts may cover the same expenditure as is shown in the annual returns on county road work.

VI.

HEAVY TRAFFIC HIGHWAYS

The motor truck as a means of transportation has come into recent prominence through its use for war purposes, through its application to freight transfer between adjacent cities and towns and over routes from fifty to one hundred and fifty miles in length. Indications are many that, coupled with roads of adequate strength, the motor truck will become an ever increasing factor in this regard. Giving evidence before the Railway Commission of Canada in regard to freight rates, it was recently stated by railway officials that the influence of motor trucks on local freight adjacent to large cities is very great; that in certain cases steam railways now receive very little local freight within a radius of fifty miles from large cities having systems of good roads adjacent to them, as it is handled by motor truck.

Just as railways were compelled to use heavier rails and increased strength of roadbed to carry heavier trains and engines of the Mogul type, so will it become necessary to build stronger highways to serve the traffic of heavy motor trucks, particularly on main lines between cities and radiating from large centres of population. The wear from comparatively light and rapid traffic of passenger vehicles is first apparent on the road surface. Heavy trucks, on the other hand,

while requiring durable surfaces, demand proportionately durable foundations. Heavy motor traffic has a shattering effect on weak foundations. The depth and strength of foundation is a primary consideration in providing roads which will give the motor truck freedom to enter the field of freight transfer to the extent to which it is economically possible.

The cost of constructing roads is largely in proportion to the depth of stone required. The necessary depth of stone will depend largely upon the character of the sub-soil over which the road is laid—the safe bearing pressure of the soil: and upon the maximum weight of loaded trucks permitted to use the road. The maximum weight of truck is a controllable factor, and should be fixed by regulation.

With unlimited funds, roads can be built which will sustain unrestricted traffic. But funds available are limited, and it is therefore necessary that reason-



GRADING EQUIPMENT.

On the Provincial Highway; particularly adapted for cutting away high shoulders, on old gravel and stone roads.

able standards be fixed and strictly enforced; and that roads be then designed for these conditions.

A reasonable maximum weight of truck should be determined; one which will serve the greater proportion of commercial needs. It is not good business judgment to spend large sums to build roads to the standard of a few trucks of excessive capacity. Trucks of excessive capacity should be prohibited. And regulation is particularly desirable with respect to roads of minor importance, and at seasons of the year when all roads are weakened by moisture and frost.

Bearing Pressures of Soils

Dealing with roads of the broken-stone or macadam type, the maximum load which a road should carry depends in the first instance on the strength of the sub-soil. There is much variation in the supporting strength of different soils, and

under different conditions of moisture and climate. Thus "clay" may vary from hard-pan to clay loam; and a dry clay will support a much heavier load than when wet.

Safe bearing pressures of different soils have been determined in a general way for masonry structures. Experimental investigation with special reference to road surfaces would no doubt develop useful data; but in the absence of more direct information, the bearing pressures adopted for the present purpose are those of the general Bridge Specifications of this Department, viz., gravel, 8 tons per square foot; compact sand or firm clay, 4 tons per square foot; clay moderately dry, 2 tons per square foot; wet clay, one ton per square foot; quicksand or wet, yielding soil, $\frac{1}{2}$ ton per square foot.



GRAVEL ROAD.

With earth shoulders turned outward by grading machine. On the Provincial Highway in Darlington Township.

The Road Foundation

A concentrated wheel-load is carried downward through a broken stone crust to the sub-soil, at an angle which, it is estimated, diverges outward at about 30 degrees from the vertical. Thus the effect of the "macadam" crust is to distribute the wheel-load over a greater area of sub-soil; this area increasing with the depth of the stone crust. The depth of stone in excess of the layer needed for immediate surface wear is therefore regarded as the road "foundation." It is the layer of stone artificially laid over the natural sub-soil to the depth necessary to sustain an unyielding surface.

Weight of Vehicles

The maximum weight of vehicles (apart from the well recognized influence on bridges) thus largely determines the depth of foundation necessary on a given

road—the depth of foundation varying also according to the nature of the subsoil, and particularly in northern climates, the season of the year during which heavy vehicles may use the road. The constant passing of many light vehicles will, it is true, influence the foundation, and to meet this condition a certain “mass” is required; but a very few heavy vehicles may shatter an insufficient foundation and thus destroy the entire construction. It is necessary, therefore, that the engineer should know whether the maximum load is to be 6 tons, 10 tons, 15 tons, or 20 tons; particularly the maximum load concentrated on one axle or one wheel; and also the width of tire on which the maximum load is concentrated.

Commonly, a motor truck, itself weighing 5 tons, can carry a load of 7 tons, making 12 tons in all. Two-thirds, or 8 tons is on the rear axle; one-half of that load, or 4 tons, is on each rear wheel. The disruptive effect of this load on roads of light construction is very great—particularly in wet seasons.

Steam trucks, with steel tires, in some cases corrugated, are now in occasional use. As an instance, a 5-ton steam wagon in running order with fuel and water weighs about 6 tons, 10 cwt., with about 2 tons, 15 cwt. on the front axle and 3 tons, 15 cwt. on the back axle. Practically all the load would come on the back wheels, so that when loaded with 5 tons the actual weight on the back axle would be 8 tons, 15 cwt., or over 4 tons 7 cwt. on each rear wheel. Motor trucks carrying 15 tons and weighing in all about 30 tons are being manufactured.

Military experience will probably indicate the most desirable type and weight of truck for future industrial purposes. The great majority of trucks now used by the French armies weigh $3\frac{1}{2}$ tons empty, and 7 to 8 tons loaded. This standard, applied to road construction generally, would effect a great saving in cost as compared with the maximum of 15 or 20 tons which unrestricted loading will involve. If military preparedness demands provision for heavy artillery loading of 20 tons (and the tendency is still upward) a more moderate standard should be enforced with respect to the great network of purely agricultural and industrial roads which cannot be so built without imposing an unnecessary financial burden.

The accompanying schedule is drawn up with a view to the traffic law of Ontario, which permits a maximum load of 12 tons, or $4\frac{1}{2}$ tons on one wheel; and a maximum pressure of 650 lbs. per in. width of tire. The general assumptions are: That two-thirds of the weight of the vehicle and its load will be carried on the rear axles; that wheel pressure is transmitted downward at an angle of 30 deg. from the vertical; that the various types of subsoil will safely carry the pressure indicated at the head of each column; that the road crust is solely of broken stone or macadam construction.

From this schedule it is evident that 12 tons is the maximum load which can be carried without producing an excessive tire pressure; that there is little difficulty in providing for a 12-ton load on gravel, compact sand, or firm clay; that clay only moderately dry requires a crust approximately 10 in. in thickness; that 12 in. will take care of a 6-ton load on wet clay; but that 16 in. would be required for a load of 12 tons (a condition which could probably be taken care of by a Telford base and broken stone surface having a total depth of 12 in.). In the case of quicksand and wet, yielding soil, it is evident that special drainage or other special construction is necessary to meet the needs of any but a light load.

As clay is a soil which has very largely to be considered, its drainage and climatic conditions are evidently important factors, as indicated by the difference in depth of crust required by a moderately dry clay and one which is wet.

Table showing required thickness of Road Crust to transmit at an angle of 30 degrees from the vertical, safe bearing pressures to subgrades of various soils

650 pounds per inch width of tire up to 12-inch tire

Weight on vehicle tons	Weight on rear wheel tons	Width of tire inches	Weight per inch width of tire pounds	Depth of stone in inches					Quicksand or wet, yielding soil, ½ ton per sq. ft.
				Gravel 8 tons per sq. ft.	Compact sand or firm clay, 4 tons per sq. foot	Clay moderately dry, 2 tons per sq. ft.	Wet clay 1 ton per sq. ft.		
3	1	3.07	650	2.33	3.74	5.98	9.05	13.40	
6	2	6.15	650	2.63	4.87	7.92	12.25	18.30	
9	3	9.21	650	3.16	5.65	9.20	14.40	21.80	
10	3.3	10.25	650	3.23	5.67	9.32	14.70	22.40	
12	4	12.00	666	3.46	6.10	9.60	16.20	24.80	
15	5	12.00	833	4.20	7.26	12.00	18.60	28.20	
18	6	12.00	1,000	4.90	8.26	13.50	20.82	31.50	
21	7	12.00	1,166	5.48	9.20	14.65	22.50	34.60	

Self-propelled gasoline motor and steam trucks, in addition to their heavy concentrated load affecting the foundation, have the further disadvantage of exerting a strong shearing force transmitted to the road surface by the driving wheels, so that their use demands not only a heavy and expensive foundation, but an especially durable surface as well. Legislation limiting extraordinary traffic of this description is justifiable, in order that a large increase in the cost of roads may not be necessary to serve the requirements of a few vehicles. Such limitation at the present time forestalls the introduction of unnecessarily heavy vehicles, and avoids cases of individual hardship. Width of tire alone will not solve the difficulty, as, owing to the necessary camber of the road surface, excessive width places the load on the edge of the tire. Should investigation justify it, a less weight than that now permitted in Ontario would be most desirable in the interest of road maintenance.

While the limiting loads for Ontario have been fixed as previously stated, it will be desirable to carefully observe the future trend of commercial traffic in order that, if possible, the maximum load may be still further reduced. In 1917 there were registered in Ontario 4,929 motor trucks. Of these, nearly 75 per cent. were classed as one-ton or less; over 97 per cent. were $3\frac{1}{2}$ -ton or less, or within the general military truck standard; while less than 3 per cent. were 4-ton and upwards.

A considerable increase in motor truck traffic appears probable after the close of the war. At the present time in Ontario one vehicle in seventeen is a commercial vehicle; while in the eastern manufacturing states, one vehicle in six is a truck. Growth of motor truck traffic to the latter proportion will undoubtedly create the need for stronger foundations, particularly on interurban highways; and over certain qualities of sub-soil the use of concrete in place of ordinary broken stone or Telford base, is strongly indicated.

VII.

RECENT ROAD LEGISLATION

Road legislation has for several years been in a stage of transition due to the changing character of traffic on the public highways, to the growing importance of highways, and the consequent need for a readjustment of road laws. Laws must change to meet changing conditions. Nor are laws capable of a mathematical directness of results, but require certain experimental periods in which to fully develop them to meet all needs and conditions. Ontario has reached a gratifying measure of success in this regard, as is indicated by a review of the Highway Laws of the Province, which appeared editorially in *The Surveyor* (London, Eng.) a leading authority in municipal matters, and which closes as follows:—

“It will be observed that not only has the principle of main roads being considered as a national charge been recognized, but that a fairly elaborate system of graduated charges between township, county and province, with joint control, has been set up. Thus, beginning with statute labour, as this country did, the Province of Ontario has arrived earlier at the goal of equitable highway finance. The example, in its broad lines, is one which might well be considered with a view to the adoption of a similar plan in the Mother Country.”

This endorsement is exceedingly encouraging to those who have sought to perfect the organization for road improvement in Ontario, and justifies the belief that efficiency, coupled with equitable distribution of cost, will result. In considering this organization several facts should be kept in mind, important of which are:—

1. That roads must be built and maintained in proportion to traffic—expenditure being in like ratio.

2. That, as laid out in Ontario, about 20 per cent. of the roads will carry 80 per cent. of the traffic.

3. That experienced and competent management is a prime necessity if expenditure on roads is to give, with economy, the desired results.

4. That country roads, of direct benefit to the townships, are also of benefit to the towns and cities, and the latter should contribute in some degree.

A study of recent road legislation in Ontario will show that none of the foregoing principles has been overlooked; and that a full measure of co-operation in giving effect to these laws, is justified.

Road Laws of Ontario

The road laws of Ontario are based on the municipal system which grew up in the 19th century, and which has created excellent and progressive local self-government throughout the Province. Towns, villages, and cities are responsible for the upkeep of streets within their boundaries; but the care of the roads in the open country constitutes one of the chief duties of township and county councils.

Provision for municipal organization is made by the Municipal Act; which Act defines the general authority of municipal councils with respect to roads. Township councils usually consist of a reeve and four councillors. A county comprises a group of townships, and the county council is composed of the Reeves (and deputy Reeves) of the townships, towns and villages included within the area of the county.

Township Roads

Township councils, in the earlier history of the Province, depended largely on statute labour for road improvement; this system having been created by the first parliament of the Province (then Upper Canada) in 1796. Money expenditure, raised by general levy on the township assessment, has been steadily increasing. At the present time townships are spending annually over \$1,400,000 in cash and 1,100,000 days of statute labour; having a total estimated value of \$2,500,000 annually.

Township councils have authority to pass by-laws to commute or abolish statute labour. About one-quarter of the townships have done so, while the number is steadily increasing.

The Highway Department is encouraging all townships to place their road expenditure in charge of a permanent road superintendent or foreman and to this end will pay (under the Ontario Highways Act, 1915) one-quarter of the salary of such an official; the Provincial grant not to exceed \$150 annually.

County Roads

Provincial aid to road construction is given principally through County Road Systems, under the Highway Improvement Act. The chief features of this Act are as follows:—

A county council is authorized to assume by by-law a system of roads for construction and maintenance; the Province contributing 40 per cent. of the expenditure on construction and 20 per cent. of the cost of maintenance.

A by-law adopting such a system may be passed by a two-thirds majority of a county council representing at least one-half of the total equalized assessment of the county.

The roads assumed are usually such as will accommodate the greater part of local market travel, creating a system of main market roads. They are the roads radiating from local market centres and shipping points, but should be connected as far as practicable to serve the needs of through traffic of the locality.

The mileage of roads assumed by a county is usually from 12 to 20 per cent. of the total mileage of the county.

The direction and superintendence of the work is placed in charge of a county engineer or capable superintendent appointed by the county council. A committee of the county council should co-operate with, advise and direct the road superintendent.

Roads are to be built in accordance with the regulations of the Department of Public Highways. The construction should be suited to local material and traffic. A standard type is regarded as a roadway well drained, graded to a width of 24 feet to 28 feet between ditches, with broken stone or gravel in the centre to a width of from 9 to 18 feet, and consolidated by rolling.

The cost varies with local conditions, but is in general proportionate to the width and kind of metal.

The system of roads assumed, and the by-law fixing the plan of improvement are subject to approval of the Provincial Department.

When roads are assumed by a county council under this Act, township councils cease to have control over them, nor should they make any expenditure on them. The county council is thereafter responsible for construction and maintenance.

The Provincial grant is paid annually, and is based on a statement of expenditure for the year, submitted to the Department by the county council, and includes all costs of labour, material, engineering services, salary of road superintendent, machinery, and bridges on the designated system of county roads.

The county council may finance construction by issuing debentures for a term not exceeding thirty years; or by sums raised from year to year in the annual county rate.

The cost of purchasing and reconstructing toll roads may be included in the expenditure.

The county council may by by-law make grants to towns and villages not separated from the county, for the improvement of extensions or connecting links of county roads in such towns and villages, and certain of such grants may be included in the statement of annual expenditure. Grants eligible for a Provincial subsidy are those made to towns or villages having a population of 1,500 or less; and those made to towns with a population of over 1,500, provided the improvement is carried out on suburban streets passing agricultural land.

Suburban Roads

Provision is made under the Ontario Highways Act, that a city may co-operate with the county council in improving the leading county roads adjacent to the city, and thereby obtain a more substantial type of construction for such suburban roads. The procedure is as follows:—

A county council by resolution makes application to the Lieutenant-Governor in Council asking that a commission be selected to deal with the suburban roads or portions thereof in the county system adjacent to the city, towards the construction and maintenance of which the city in question should contribute.

The Department of Public Highways submits the application to the city in question and considers their views in the matter.

Should the Commission be recommended by the Department and authorized by Order-in-Council, it is made up of representatives chosen by the city and county council. In the case of a city having a population of less than 50,000 it would be composed of three persons, the county council selecting one member, the city selecting one, and the two agreeing upon a third. In case of cities of over 50,000 population, the Commission would be composed of five persons selected in a similar manner.

The first duty of the Commission would be to determine the roads, and the length of each adjacent to the city, to which the city would contribute; the Commission forming a board of arbitration for that purpose.

It is then the duty of the Commission to determine the work to be undertaken each year and to estimate the amounts required for construction and maintenance.

The county council would first approve or amend this estimate and authorize expenditure. It is then the duty of the county council, not later than the first day of March in each year, to notify the city of the amount required.

For construction the Province contributes 40 per cent. and the county and city each 30 per cent.; for maintenance and repair the Province contributes 20 per cent., and the county and city divide the remainder equally between them.

The section of county road designated as "suburban" remains a county road for which the county is responsible; the work of construction and maintenance to be carried on under the county road superintendent but subject to the instructions of the special Commission.

Provincial Highways

A system of Provincial highways has been authorized by the Provincial Highway Act of 1917, with a view to the construction and maintenance, under the Highways Department, of leading highways throughout the Province. A highway from east to west across the Province would be the main artery of such a system, with suitable connecting branches leading to important terminal points.

The Act authorizes the Provincial Highways Department, with the approval of the Lieutenant-Governor in Council, to take over on behalf of the Crown, any public highway, by filing a route plan of the road in the local registry office, and giving notice in the *Ontario Gazette*.

The Department, through its officers, is thereafter responsible for the proper construction and maintenance of the highways so assumed. For this purpose the Department has the usual powers of municipal corporations to widen or deviate the road allowance, procure material for construction, purchase machinery, and in general to control the use of the highway under the usual responsibilities placed upon municipalities.

Adjacent to cities the cost is borne in the proportion of 40 per cent. by the Province, 30 per cent. by the city, and 30 per cent. by the municipality through which the road passes. Outside of the suburban section, the Province assumes the proportion levied on the city, thereby paying 70 per cent. and the local municipality 30 per cent. In the case of bridges, the local municipality is placed on the same basis as in the case of a county road; viz., the local municipality pays 60 per cent. of the cost of a bridge suitable for county purposes, and the Province pays the balance. In cases where a special type of pavement is desired by a locality, provision is made for levying any excess part of the cost on a frontage basis. Various contingencies are provided for, with in general, a right of appeal to the Ontario Railway and Municipal Board.

All cost of surveys, the purchase of machinery, plant and equipment, land for widening or deviating, general overhead and staff expenses are to be borne entirely by the Province. Thus the local municipalities will in effect, be required to pay less than 30 per cent. of the total cost.

A fundamental basis upon which the cost is distributed is that each local community should be required to pay for a road suited to local requirements. It is unfair to the rest of the Province to levy less than that amount. It is unfair to the local municipality to require it to pay the entire cost of a road carrying an excessive amount of through traffic. The difference between the cost of a road suited to local requirements, and one of a character suited to the traffic of a main road, is therefore to be levied upon cities immediately served, or is to be met by the Province from the revenue from motor vehicles. A main road



ROUGE RIVER BRIDGE.

An old structure on the Provincial Highway in Pickering Township.

from the County of Essex to the Quebec Boundary with branches to St. Catharines and Ottawa, passes through urban and rural municipalities having half the population of the Province, and over 60 per cent. of the assessment.

The building of the Provincial Highway System will not be undertaken as a huge work of continuous construction, but will be a matter of gradual development and extension. Wherever conditions are favourable, systematic maintenance will be applied so as to make the most of any reasonably good sections as they now exist. Construction will be taken up in sections where traffic is especially heavy and where the road has heretofore been most neglected. One type of pavement throughout is not contemplated. An effort will be made to construct in proportion to traffic, making the best possible use of local materials.

The immediate need is for a reasonably good trunk road system, joining up cities and local road systems, and making it possible for each local community to be

a unit in such a trunk system without carrying an excessive or burdensome share of the cost.

Provincial County Roads

Co-operative with Provincial roads, but under county control, certain roads may be designated by the Highway Department as "Provincial County roads"—to such roads the Province will contribute 60 per cent. of the cost of construction and maintenance. These roads are intended to enable the more equitable maintenance of certain county roads of more than local importance carrying a considerable proportion of through traffic, but which the county may efficiently maintain; roads which are not of sufficient importance to be classed as Provincial, or which it is not desirable or expedient for the Province to assume, as Provincial Highways. They continue to be county roads, but because of heavy through traffic, receive an increased subsidy.

In general, they will form branches of the Provincial Highway System, joining up cities and other important terminal points of traffic. They constitute an intermediate link between the Provincial and county road systems, and should be subject to special regulation. In time, some of them, with the development of the road system, may become Provincial Highways, so that the regulations under which they should be built and maintained, more especially as regards primary construction such as grading, bridges and culverts, should be of a kind readily adaptable to a Provincial standard.

To become entitled to the Provincial subsidy of 60 per cent. for construction and maintenance, the general regulations of the Department should be followed, but with special regard to the following features:—

1. The road allowance to be uniform and not less than 66 feet in width, unless impracticable because of engineering difficulties.
2. The earth grade to be of uniform width, having a clear width of 28 feet between shoulders, safe and convenient for travel.
3. The paved or metalled surface to be double track not less than 14 feet nor more than 18 feet wide.
4. Drainage to be continuous, well defined and adequate, with free and sufficient outlet.
5. The road foundation to be adequate and designed according to material and sub-soil, for a 12-ton load, 9 tons on rear axles, with wheels carrying 650 lbs. per inch of tire.
6. Dangerous corners and sharp turns to be eliminated, giving a clear view for at least 300 feet.
7. Excessive grades to be reduced as far as practicable, with from 4 per cent. to 6 per cent. regarded as desirable standard.
8. Steel bridges and the longer concrete bridges to have a clear width of not less than 20 feet, and to be designed for Class "C" of the Departmental Specifications; concrete culverts and small bridges carrying fill to be so designed as to carry a surface grade 28 feet to 30 feet wide.
9. The Department to be notified well in advance of all proposed construction; plans and specifications governing all such construction to be submitted for and to be subject to the approval of the Department; and all construction to follow lines and levels approved by the Department or given by the Department from actual survey. By this means the services of the engineering staff of the Department will be of much assistance to counties in developing these roads.
10. A system of maintenance to be applied which will be prompt, continuous and adequate, and approved by the Department.

As with the general regulations, local conditions, and temporary needs should be taken into consideration, so that the Department should necessarily retain authority to exercise some latitude in carrying out any regulations that may be adopted.

Bridge Specifications and Plans

The provisions of the Municipal Act which have heretofore applied to county bridges have been extended to township bridges, in order that township councils may have the assistance of the Department of Public Highways in the erection of bridges.

Section 459 of the Municipal Act now provides that county bridges of a permanent type, or township bridges in excess of twenty feet clear span, shall be designed and built in accordance with general specifications approved by the Department: and that plans may be examined and certified by the Department without cost to the municipality.

To meet the needs of the Act, standard highway bridge plans have been prepared by the Department, copies of which may be had by municipal councils or municipal engineers upon application. The plans cover general dimensions for reinforced concrete bridges for spans between 4 feet and 20 feet, and with a 20-foot roadway; also steel truss bridges for spans from 34 to 84 feet. The steel truss plans are in two series; series A, having a roadway 16 feet wide, and series B with roadway 18 feet wide.

The plans in all cases are for Class A loading, Ontario Highway Bridge Specifications, designed for a 15-ton steam roller, and a uniform load of 100 lbs. per square foot of floor.

Load of Vehicles Act

The Load of Vehicles Act (6 George V, Chapter 49) is an important addition to the Statutes of the Province in relation to highways. The development of motor vehicles has produced heavy trucks, carrying loads of excessive weight, such as are exceedingly destructive to roads and pavements, particularly during the wet seasons of spring and fall, when the sub-soil is saturated and gives least support to the road crust. Heavy trucks used under such conditions have a shattering, rutting effect on the pavement or road surface which promises to be costly both in the construction and in the maintenance of roads.

The Act provides that the width of tires is to be not less than one inch for each 650 pounds resting on the wheel. This applies to wagons and horse-drawn vehicles as well as to motor vehicles. Thus a wagon with two-inch tires and an evenly distributed load, may legally carry 5,200 pounds, including the weight of the wagon and driver, with three-inch tires, 7,800 pounds; and with four-inch tires, 10,400 pounds.

Loads are limited to a maximum weight of twelve tons, including vehicle and load; and the weight on any one wheel is restricted to four and one-half tons.

The use of any flange, rib, clamp, or other device attached to wheels and injurious to the highway, is prohibited.

The speed of heavy vehicles is restricted as follows:—

In excess of four tons (vehicle and load)	10 miles per hour.
In excess of six tons, rubber tires	8 " "
In excess of six tons, iron or steel tires	6 " "

The speed of vehicles passing over a bridge may be limited by a municipal council to five miles an hour.

No vehicle shall have a greater width than 90 inches except traction engines, which may have a total width of 110 inches.

Prior to this Act, there was no limitation to the weight of vehicles on the highway, nor was there any limit to the load which bridges and culverts should support, except in the case of traction engines. Municipal councils were responsible for the sufficiency of such structures under any load which a motor truck might carry. A weight of twelve tons, or four tons on a wheel, or 650 pounds per inch of tire, now fixes a standard to which roads should be constructed, and for which bridges and culverts should be designed.

The Motor Vehicles Act

The administration of the Motor Vehicles Act was, by an amendment (6 George V, chap. 47) vested in the Department of Public Highways. The issuance of motor permits, the fixing of motor car fees, the collection of revenue, the licensing of chauffeurs, a general oversight of highway traffic laws and regulations and their enforcement, together with highway construction and maintenance are thus brought under the view of one Executive Department. That the use and wear of highways, and the revenue therefrom, should be associated with construction and maintenance is consistent, and in the interest of efficient management.

An amendment authorizes reciprocal interchange of motor license privileges between Ontario and American States. It was felt that Ontario motorists who are paying a reasonable license fee in this Province should, in part return, be secured such convenience in the use of roads in adjoining States as might reasonably be obtained. It is also desirable to encourage tourist traffic from foreign countries. While the Ontario fee remained at a very low amount, it constituted but very little obstacle to tourists, but the advanced schedule of fees became a serious obstacle to travellers entering the Province for a few days by motor car.

It has been broadly estimated that the average car entering the Province for touring purposes carries four passengers, and that the average daily expenditure is \$5.00 for each person. At this rate, 50,000 foreign cars remaining in the Province an average of 10 days each, and four persons per car, would put \$10,000,000 in circulation. A tourist traffic of this dimension, should, with reasonably good roads, be readily attainable by the Province, and would be of much benefit to Muskoka, Parry Sound, the Kawartha Lake country, and numerous summer resort localities adjacent to the Great Lakes.

Department of Public Highways

The road organization of Southern Ontario is centralized in the Department of Public Highways, under the Minister of Public Works and Highways, and is in charge of a Deputy Minister, Chief Engineer, and staff. The duties of the Department have a considerable range including:—

The administration of the Highway Improvement and Ontario Highways Acts; which provide for subsidies to county, suburban and main roads:

The administration of the Provincial Highways Act.

The administration of the Motor Vehicles Act: including the issuance of permits for motor vehicles, licenses for chauffeurs, etc.:

The administration of the provisions of the Municipal Act with respect to plans and specifications for steel and concrete bridges:

Consultation with town, city and township councils with respect to road and street improvement:

The construction of model and experimental roads:

Educational measures such as the publication of road bulletins and reports, investigation of county road materials, and the making of road surveys and estimates.

APPENDIX A

Expenditure on

The following Schedule shows in detail the work and approved expenditure on County

County.	Work done during year							Ap- Roads and Culverts
	Miles graded	Miles stoned	Miles gravell- ed	Tile Drain rods	Bridges	Pipe and Tile culverts	Other Culverts	
								\$ c.
		.29(con.)			4	5	8	17,122 68
Wentworth		1.28			1	1		18,198 65
Lanark		6.00	0.75		2	14	4	10,831 50
Simcoe	1.5		3.08		8	59	11	12,329 79
Wellington		2.3	1.12	43	4	32	10	36,032 53
Lincoln	46.00	1.4		144				21,247 15
Oxford		4.25	2.75	1,873	5	16		1,556 25
1915 Deferred								7,665 43
1916 Deferred								3,584 87
Hastings		2.25					2	5,141 86
Peel			5.25		1	7	2	39,793 54
Middlesex	12.75		27.75	224	4	9	2	3,716 02
Lennox & Addington		1.1				7	1	6,756 48
Prince Edward	0.12	1.12	1.75			4		44,209 24
Halton	2.00	4.18		109	1	16	7	28,132 25
Perth	0.67	2.39	11.55	1,344	2	6	2	19,098 09
Frontenac	7.75	4.65			1	49	7	
		.15 con.						
Waterloo	3.92	4.80	16.60	36		10	1	26,300 86
Carleton	5.08	2.75	8.95		4	20	3	28,087 74
1915 Deferred						5	3	13,458 41
Leeds and Grenville	0.5	5.0				20	33	195,965 08
*York	0.76	13.24		48	3			3,150 00
1913-14 Deferred	1.25					67		7,976 67
Haldimand		1.12				11	15	46,034 23
Welland	3.02	4.67				5	13	7,336 69
Essex	0.7			11	4	5		29,557 44
Prescott and Russell		4.47		16	4			
Dundas, Stormont & Glengarry				82	16		2	1,871 81
Brant	15.5			75	1	2	3	3,596 67
Victoria	3.06					11	3	1,688 85
Huron					5	5	3	3,932 20
Huron					4	3	6	1,349 61
Bruce	0.12		1.0			6		384 34
Norfolk				32	1			2,663 96
Kent			0.5	311		8	3	1,735 39
Elgin						7	2	
Total	104.70	70.41	79.05	4,348	75	410	146	650,506 28

* Also \$5,275 00 for purchase of Toll Road.

APPENDIX A

County Roads

Roads during 1917; and upon which Provincial subsidies were paid during 1918

proved Expenditure for Year				Construction		Maintenance		Total Government grant
Bridges	Machinery and Repairs	Special grants	Superintendence	Total approved Expenditure	Government grant	Total approved Expenditure	Government grant	
\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
6,166 20	2,070 51	.....	2,945 45	28,304 84	11,331 94	28,043 19	7,608 64	18,940 58
15,545 83	5,471 39	3,000 00	1,321 11	43,536 98	17,414 79	12,734 76	2,546 95	19,961 74
2,258 48	.....	9,791 69	1,800 00	24,681 67	9,872 67	23,852 75	4,770 55	14,643 22
11,598 43	1,637 29	3,519 18	2,011 17	31,095 86	12,438 34	14,607 91	2,921 58	15,359 92
6,366 74	9,901 78	.....	2,937 55	55,238 60	22,095 44	33,830 10	6,766 02	28,861 46
4,990 75	917 46	.....	1,408 82	28,564 18	11,425 67	8,763 23	1,752 65	13,178 32
.....	.....	.....	.....	1,556 25	+518 75	.....	.....	3,584 92
.....	.....	.....	.....	7,665 43	3,066 17	.....	.....	.....
.....	358 45	.....	2,000 00	5,943 32	2,377 33	27,913 33	5,582 67	7,960 00
1,114 70	156 38	.....	1,230 10	7,643 04	3,057 22	12,801 76	6,455 35	9,512 57
5,152 56	4,280 76	4,616 00	2,338 86	56,181 72	22,472 69	16,191 57	3,238 31	25,711 00
.....	495 77	2,564 05	977 09	7,752 93	3,101 17	7,446 59	1,489 32	4,590 49
.....	1,190 05	.....	1,209 12	9,155 65	3,662 26	12,782 86	2,556 57	6,218 83
28,437 73	378 10	.....	1,100 00	74,125 07	29,650 03	4,988 35	997 67	30,647 70
1,370 00	52 40	.....	863 00	30,417 65	12,167 06	3,554 85	710 97	12,878 03
993 07	2,832 64	.....	1,275 38	24,199 18	9,679 67	11,926 92	2,385 38	12,065 05
4,632 71	1,098 06	.....	2,116 03	34,147 66	13,659 06	7,390 33	1,478 07	15,137 13
17,360 35	131 97	.....	934 72	46,514 78	18,605 91	7,515 75	1,503 15	20,109 06
1,183 18	.....	.....	.....	1,183 18	+394 29	.....	.....	394 39
.....	686 74	2,037 99	1,806 33	17,989 47	7,195 79	2,323 92	464 78	7,660 57
11,989 44	2,380 61	.....	3,355 46	218,965 59	87,586 24	27,406 92	5,481 38	93,067 62
.....	.....	.....	.....	3,150 00	+1,050 00	.....	.....	1,650 00
.....	1,622 85	2,780 00	1,404 62	13,784 14	5,513 66	16,934 76	3,386 95	8,900 61
.....	898 37	.....	1,610 43	48,543 03	19,417 21	23,538 88	4,707 78	24,124 99
10,454 80	683 77	.....	1,619 93	20,095 19	8,038 08	4,544 86	908 97	8,947 05
33,459 86	21,836 52	.....	1,573 02	86,426 84	34,570 74	6,387 91	1,277 58	35,848 32
31,084 26	4,242 05	.....	2,392 48	39,590 60	15,836 24	19,672 49	3,934 50	19,770 74
123 29	2,876 11	.....	1,409 53	8,005 60	3,202 24	7,789 38	1,557 87	4,760 11
.....	8 50	1,205 42	712 39	3,615 16	1,446 06	3,112 43	622 49	2,068 55
3,816 93	.....	.....	572 04	8,321 17	3,328 47	947 92	189 58	3,518 05
3,172 42	.....	.....	1,008 25	5,530 28	2,212 11	9,560 57	1,912 11	4,124 22
8,100 50	.....	.....	398 30	8,883 14	3,553 26	801 98	160 40	3,713 66
.....	.....	.....	638 20	3,302 16	1,320 86	6,653 67	1,330 71	2,651 57
.....	32 00	.....	937 05	2,704 44	1,081 78	7,507 13	2,579 07	3,660 85

209,372 23 66,240 53 29,514 33 45,906 43 1,006,814 80 402,343 20 381,527 07 81,278 02 483,621 32

† 33½ per cent.

APPENDIX B

Expenditure on

The following Schedule shows in detail the work and approved expenditure on County

Construction Work Done during year								Approved
County.	Miles graded	Miles stoned	Miles gravelled	Tile Drain rods	Bridges	Pipe and Tile Culverts	Other Culverts	Roads and Culverts
								\$ c.
Wentworth				299	1	11	3	11,923 79
Lanark		1.75	0.75			3	2	5,354 20
Simcoe	3.5		0.75		5	34		3,822 32
Wellington	7.23	0.67	2.23	83	11	72	8	14,907 41
Lincoln		2.0		640		15	6	21,392 81
Oxford		8.75	3.0	473		22		27,197 21
Hastings		1.94	3.37		5			4,111 04
Peel		1.3	8.9			21	1	26,671 95
Middlesex	6.0		26.83	996	5	21	2	37,222 61
Lennox & Addington		2.71				18	4	7,745 81
Prince Edward	4.8	2.3	1.9			13		12,467 62
Halton	2.25	4.0	2.0	9	2	11	10	20,398 46
Perth	4.25	2.37	10.75	1,366	1	13	1	20,759 25
Frontenac	1.65	6.1	1.5		1	37	5	18,725 63
Waterloo	2.0	1.6	12.25	55	1	19		18,402 41
Carleton	3.83	2.12	5.43		1	26		13,495 47
Leeds and Grenville 1910-1915 } Supplementary)		1.55				1		3,773 97
York	0.44	11.20		175	4	26	33	134,079 33
Haldimand	4.08	1.0			5	116	5	7,845 73
Welland	0.5	12.06			2	35	3	82,703 71
Essex	1.35			44	2	6	5	9,020 64
Totals	41.88	63.42	79.66	4,140	46	520	88	502,021 37

APPENDIX B

County Roads

Roads during 1916; and upon which Provincial subsidies were paid in 1917

Expenditure for year				Construction		Approved Main- tenance		
Bridges	Machinery and Repairs	Special Grants to Towns, Villages and Tps.	Superin- tendence	Total approved Expendi- ture	Govern- ment grant 40%	Mainten- ance	Grant	Total Grant
\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
960 00	1,579 73		2,866 58	17,330 10	6,932 04	31,622 90	6,324 58	13,256 62
	945 03		1,084 00	7,383 23	2,953 29	9,955 78	1,991 15	4,944 44
17,418 04	464 47	2,333 03	1,810 50	25,848 36	10,339 34	20,538 34	4,107 67	14,447 01
17,755 54	1,684 78	1,006 49	2,367 82	37,722 04	15,088 82	18,368 06	3,673 61	18,762 43
	1,575 38		1,057 09	24,025 28	9,610 11	17,950 70	3,590 14	13,200 23
135 02	3,038 94	1,301 33	1,391 72	33,064 22	13,225 69	12,725 76	2,545 15	15,770 84
20,884 42	440 73		1,600 00	27,036 19	10,814 48	21,350 64	4,270 13	15,084 61
	808 71		1,189 45	28,670 11	11,468 04	12,090 50	2,418 11	13,886 15
20,229 94	808 36	1,668 80	2,272 65	62,202 36	24,880 94	17,029 13	3,405 83	28,286 77
	576 90	1,870 98	1,047 93	11,241 62	4,496 65	5,204 70	1,040 94	5,537 59
	2,777 26		1,469 55	16,714 43	6,685 77	14,772 96	2,954 59	9,640 36
1,082 20	1,020 30		1,108 00	23,608 96	9,443 58	9,385 86	1,877 17	11,320 75
2,067 50	250 00		823 00	23,899 75	9,559 90	5,067 68	1,013 54	10,573 44
198 67	1,666 25		1,414 26	22,004 81	8,801 92	4,376 79	875 36	9,677 28
340 00	6,762 40		2,122 33	27,627 14	11,050 86	5,636 07	1,127 21	12,178 07
2,401 54	145 28		968 20	17,010 49	6,804 20	6,427 78	1,285 56	8,089 76
	255 86	5,166 89	1,691 33	10,888 05	4,355 22	921 83	184 37	4,539 59
1,686 87		3,201 81		4,886 68	*1,629 56			1,629 56
3,923 30	768 48		3,383 52	142,154 63	56,861 85	28,632 97	5,726 59	62,588 44
6,762 53	1,477 67		1,238 11	17,324 04	6,929 62	9,582 03	1,916 41	8,846 03
469 46	2,840 02		2,187 46	88,200 65	35,280 26	17,780 01	3,556 00	38,836 26
5,948 90	82 09		604 43	15,656 06	6,262 42	1,525 46	305 09	6,567 51
102,263 93	29,968 64	16,549 33	33,697 93	684,501 20	273,474 56	270,945 95	54,189 20	327,663 76

* 33 $\frac{1}{3}$ per cent.

APPENDIX C

REPORTS OF COUNTY ROAD INSPECTION

TORONTO, January 16th, 1918.

W. A. McLEAN, Esq.,

Deputy Minister of Highways, Ontario.

SIR,—Herewith I beg to submit a brief report on those counties of Ontario in which operations under the Highway Improvement Act have been commenced since January 1st, 1917. In addition to the nine counties herein described, county road systems have been assumed by the Counties of Renfrew, Ontario, Grey and Dufferin with the intention of organizing for work in 1918.

Owing to financial conditions, and more particularly to the scarcity of labour, comparatively little permanent work, other than the construction of necessary bridges and culverts, was undertaken by the above counties. An attempt was made in nearly every case to utilize such labour as was available in keeping the roads of the newly-adopted systems in passable condition, pending the return of conditions more favourable to extensive programmes of construction. The same policy will doubtless be pursued by the majority of counties in Ontario during the coming year. This policy, born of necessity, has had the effect in many cases of distributing the benefits of county organization, during the first year of operation, over the entire county and has overcome the greater part of any opposition which may have formerly existed.

While the expenditure on maintenance in any locality has not been large, nor the permanent improvement great, the continuity of work and other benefits of county management have been realized and public opinion prepared for considerable expenditures on construction following the close of the war.

All of which is respectfully submitted.

WIMUND HUBER,

Assistant Engineer.

BRANT

Brant County assumed a system of County Roads in January, 1917, designating 105 miles of the main highways of the County, which constitutes approximately 18.2 per cent. of the total road mileage.

The work of the past year consisted principally of maintenance and the construction of a number of concrete culverts. In addition to the above, about 15 miles of substantial grading was done which will be returned as construction. An interesting feature of the year's work in Brant County is the use of two gasoline or kerosene tractors for grading operations. These two outfits were used continuously during the summer, the average rate of progress being about one-half mile per day per outfit.

Experience with these tractors, which are rated as 8-16 h.p., has shown that, while giving satisfaction on light grading operations, they have not sufficient power for heavy grading, and larger machines should be used.

No metalling of roads was attempted in 1917, but all roads which were graded were maintained in comparatively good condition by systematic dragging.

BRUCE

Bruce County Road System was adopted in June, 1917, and comprises approximately 350 miles of the leading roads in the County, or about 15.8 per cent. of the total road mileage. The system appears to have been well selected with a view to serving equitably all portions of the County and linking up the principal centres, a commendable feature being the almost entire absence of dead ends.

The system was designated first by selecting the three main roads in the county; namely, the Saugeen Road running northerly from the southerly boundary parallel to the shore of Lake Huron to Southampton, thence easterly across the County to the easterly boundary; the Durham Road from Kincardine to Hanover via Walkerton, and the Elora Road running southerly from Southampton through Paisley, etc., to the south-easterly boundary of the county. Sufficient feeders were then added to these roads to equitably serve the requirements of all sections of the County, the result being a system in which very few revisions will be required. Further evidence of careful selection is found in the comparatively small percentage of total road mileage represented by the County System.

The three main roads above mentioned were originally constructed by the County, but had since reverted to the townships. While originally constructed to a fairly high standard, they have been allowed to deteriorate and their present condition in most cases is bad. The greatest need over the whole system would appear to be thorough drainage, both by means of surface drainage and underground tile. While many of the roads show evidence of having been carefully graded at one time, they have latterly been neglected, and in many instances the drainage facilities originally supplied have become practically useless.

Pending the return of conditions more favourable for road construction, a decided improvement could immediately be made at low cost, and easily and cheaply maintained by the removal of sod shoulders and the cleaning out of side ditches.

Excellent gravel for road building purposes is to be obtained in almost unlimited quantities in nearly all parts of the County, and will constitute practically the only road building material. No machinery or equipment for road construction or maintenance has been purchased during the past year by the County, dependence having been placed on such machinery as could be borrowed from the local municipalities. Very little construction work was attempted, the principal section being a two-mile stretch of grading and gravelling on road No. 2, north of Southampton. Considerable maintenance of a substantial character has been carried on, consisting of the removal of earth shoulders and the addition of sufficient gravel to restore the crown. Most of the gravelling has been left unfinished owing to late work and scarcity of labour, but will be put into good condition in the spring.

Practically no work of organization was attempted during 1917, most of the work being done under township foremen acting under the County Road Superintendent.

STORMONT, DUNDAS AND GLENGARRY

The united Counties of Stormont, Dundas and Glengarry adopted a system of County Roads in October, 1916. The system comprises 433 miles or 21 per cent. of the total road mileage.

Roads for the most part are in poor condition, suffering from lack of maintenance. The counties include much flat country and many swamps, which will necessitate recourse to municipal drainage operations before success can be expected in substantial road improvement. A few of the most important roads radiating from some of the chief centres have been surfaced in the past with crushed stone,

but the great majority of the roads in the county are nothing more than heavy clay roads in bad condition. In many cases ditches which were originally formed have been filled up, while in other cases practically no grading has been done.

To add to the difficulty in road improvement, the majority of the roads in the county are only approximately 40 feet in width, this evidently being the width allowed in the original surveys. Before attempting work of a substantial character, provision should be made to increase the width of the road allowance to approximately 66 feet. Steps toward this end have already been taken by the counties and arrangements have been made with property holders along certain roads to set back fences when such becomes necessary.

No construction work other than a number of concrete bridges and culverts was attempted during the year. Considerable maintenance consisting principally



A CLAY ROAD IN ESSEX COUNTY.

The county road system is carefully maintained throughout by constant use of the drag.

of cutting off earth shoulders, opening ditches, etc., was accomplished and will constitute the greater part of the year's expenditure. The County Road System includes an exceptionally large number of bridges and culverts, the majority of which are of wood, many in almost dangerous condition, demanding immediate renewal. Considering the large number of such structures, there are comparatively few permanent bridges and culverts, and heavy expenditures will be required in this direction in the immediate future.

The organization of the Counties for the prosecution of the work is so far satisfactory. A committee of three has been appointed to carry on the work and the road superintendent is responsible to this committee.

The county has adopted methods of passing and paying accounts and a system of accounting in substantial compliance with the recommendations of this Department.

ELGIN

The Elgin County Road system was adopted in 1917 and originally comprised 280 miles. This was increased in 1918 to 312 miles or 26 per cent. of the total road mileage.

Construction and maintenance work were commenced in October, 1917, but owing to the lateness of the season very little was accomplished. Construction work consisted of two reinforced concrete culverts and a concrete retaining wall to protect the bank in front of one of the steel bents of Silver Creek Bridge, together with numerous corrugated iron culverts. Permanent work on an extensive scale during the war is not contemplated, but organization has been commenced with a view to keeping the present roads in reasonably good condition. Maintenance has so far consisted for the most part of the removal of earth shoulders and the application of small quantities of gravel on the worst sections.

Methods of passing and paying accounts and a system of accounting in accordance with the recommendations of this Department have been adopted.



THE WRONG METHOD.

Cleaning a municipal ditch, and placing the excavated material (sod, muck, etc.) on top of a fairly good road. This practice obstructs travel and destroys the roads.

HURON

Huron County Road System was adopted in June, 1917, and comprises approximately 347 miles, representing about 16.3 per cent. of the total road mileage in the County.

The system for the most part consists of old gravelled roads, many of which were originally constructed by the County. The majority of the roads show evidence of having been well graded, with well formed ditches. Heavy grades are comparatively few. The present condition of the roads would indicate that the greatest immediate need is systematic maintenance, the first steps toward which

would be the trimming away of earth shoulders and the addition of sufficient gravel to fill ruts and depressions and restore the crown where necessary.

Practically no maintenance work was attempted during the past season owing to lack of provision by the county for any expenditure on county roads and also to scarcity of labour. During the season the west part of the county suffered serious damage from two very destructive freshets when a number of bridges were washed out, necessitating their immediate replacement, which work has occupied the greater part of the road superintendent's time.

With the exception of Ashfield Township, where the selection of county roads appears to have been governed largely by local considerations, the county road system appears to be equitably distributed and should satisfactorily serve the county's requirements. A number of short spurs, however, might profitably be



Designed by Frank Barber, County Engineer.
CONCRETE TRUSS ON OLD STONE ABUTMENTS.
Erected by the County of York.

omitted, thus reducing the mileage to more reasonable proportions, relieving the County of considerable expense for maintenance, and corresponding responsibility and anxiety during the early stages of construction.

Up to the present the County has purchased no machinery and no road building organization has been attempted. Any maintenance work carried out during 1917 was accomplished with township outfits and township foremen.

Gravel in unlimited quantities is obtainable in nearly all parts of the County and will constitute practically the only road material for county roads. Taking into consideration the present condition of the roads, the abundance of first-class material, the absence of difficult grading problems, and the comparative ease with which drainage can be secured, the construction and maintenance of a county road system should, with suitable organization and equipment, be carried on at a minimum cost.

KENT

Kent County Road System was assumed in 1917 and comprises 330 miles of main road, or 18.4 per cent. of the total road mileage.

The work of 1917 has been principally that of organization and preliminary steps in maintenance. A patrol system has been inaugurated and, with the improvements which are almost certain to follow during subsequent years of operation, should give excellent results.

There is a great variation in the condition of the roads throughout Kent County. In the northerly part of the County, which is flat and lacks natural drainage facilities, the roads, being on heavy clay soil and having for the greater part never been metalled, are in poor condition. The southerly part, on the other hand, consists of rolling country, providing excellent drainage, and is supplied with large quantities of gravel of excellent road building qualities. The main roads in this section have been well gravelled for many years, and their maintenance will give the county comparatively little trouble.

The great need for the immediate improvement of Kent County roads, particularly in the northern portion, appears to be tile drainage, good outlets for which are provided by the numerous municipal drainage schemes in this section. Underdrainage, coupled with re-grading of the entire system and followed by systematic dragging, should accomplish much toward keeping the roads in reasonably good condition until circumstances warrant substantial construction.

NORFOLK

Norfolk County Road System was assumed in June, 1917, and comprises 262 miles, or approximately 21 per cent. of the County's total road mileage.

A County Road Committee of three members was appointed at the October meeting of County Council and preliminary steps have been taken towards organization for maintenance.

A small amount of maintenance was carried on during the latter part of the season under the new organization. No road construction was attempted in 1917, the principal item in the year's work being one steel bridge in Middleton Township.

No extensive programme of construction is contemplated until after the close of the war.

PRESCOTT AND RUSSELL

The united Counties of Prescott and Russell adopted a County Road System in October, 1916. The system comprises 225 miles of road, constituting approximately 19 per cent. of the total road mileage.

The first steps towards organization for carrying on the work have been made and are in accordance with the suggestions of this Department. A committee of five from the County Council has complete control of the work and meets monthly in various sections of the county to examine work and pass accounts. The system of passing accounts and accounting as recommended by this Department has been adopted in its entirety.

Prescott and Russell has a number of serious difficulties in connection with road improvement. Much of the country is flat and swampy, affording very poor facilities for drainage, and substantial road construction can be carried on only when the surrounding lands themselves have been drained. In many cases, municipal drainage would appear to be the only solution of this problem. The majority of the roads in the County are of either a heavy clay or a heavy sand subsoil and

have for many years been badly neglected. Road building material, while plentiful in certain sections, is totally lacking in others and must necessarily be imported, thus raising the average cost to a fairly high figure.

Lack of maintenance has resulted in a condition of roads which is probably not paralleled elsewhere in Ontario. Extensive maintenance in order to bring the majority of the roads to even passable condition is urgently required and should be the first care of the county in connection with the county road system. A fair start was made during the season of 1917 towards this end, but owing to labour shortage and an unusual amount of wet weather, progress made was not as great as had been hoped for.

A substantial start in road construction has been made. Three sections of approximately two miles each of water bound macadam have been laid at widely separated points in the County and are accomplishing much in the education of the ratepayers and the formation of public sentiment in favour of an extensive programme of road improvement. Of these three sections, two were constructed by the County, operating in each case a complete road building outfit purchased during the year. The third section between L'Orignal and Hawkesbury was constructed by contract and is an excellent piece of work. Considering the County's lack of experience in road building, the two sections completed by day work, one south of the Village of St. Isidore de Prescott and the other east of the Village of Russell, are fairly creditable. The three sections constructed were selected partly on account of their location, the desire being to demonstrate the benefits of improved roads in different sections of the County, and partly because of the proximity of suitable material in each case. The sections constructed by day work were built of a good grade of quarried limestone obtained in the vicinity of the work. The section built by contract was commenced with crushed boulders and finished with quarried limestone obtained near the Town of Hawkesbury.

VICTORIA

A County Road System comprising 230 miles of roads in the southerly six townships of Victoria County was assumed in March, 1917. The said roads constitute 21.8 per cent. of the total road mileage in the area covered by the system.

The present condition of the county roads varies. In Mariposa where the work has been carried on for a number of years under the direction of a Township Road Superintendent and where field stone of fair quality has been plentiful, the main roads are in comparatively good condition. In other sections of the County, and particularly in the immediate vicinity of Lindsay where less attention has heretofore been given to road organization and maintenance, the roads which are largely on heavy clay soil have been neglected and are now in need of immediate attention.

The County faces a number of problems in road construction, such as bad hills, long swamps, etc., which will tend to make road construction fairly expensive. Road material is unevenly distributed, being plentiful in some sections and totally lacking in others. Gravel, field stone and limestone in place are all found in different localities and will, no doubt, all be utilized in the construction of the county roads.

Construction work of 1917 includes a number of short sections of substantial grading. An organization for maintenance has been commenced, but owing to the scarcity of labour it was found impracticable to carry on much work in a systematic manner. The present plans of the county provide for very little work other than maintenance work till after the close of the war.

PARLIAMENT BUILDINGS, TORONTO, ONT.

December 1st, 1917.

W. A. McLEAN, Esq.,
Deputy Minister of Highways, Ontario.

SIR,—I have the honour to submit a summary report on the improvement of the county roads in the Counties of Wellington, Waterloo, Lincoln, Haldimand, Simcoe, Frontenac, Peel, Perth, Lanark and York, to the end of 1917, according to the provisions of the Highway Improvement Act.

In addition to the regular departmental inspection a number of special visits were made during 1917 at the request of the county road superintendents and county councils, when matters of special importance were being considered. The assistance and advice of the Department in such cases appeared to be very much appreciated by the local authorities.

An amendment to the Highway Improvement Act passed by the Provincial Legislature in 1916 makes provision for the payment of a subsidy of 20 per cent. of the cost of maintenance of county roads both before and after construction. All of the counties dealt with in the following report took advantage of this assistance by systematically maintaining their county roads. They received, as formerly, the usual subsidy amounting to 40 per cent. of the cost of such permanent improvement, as was performed according to the requirements of the Department.

The work as a whole showed a marked improvement and a better understanding of the principles of road construction on the part of the local officials throughout the Province.

Respectfully submitted,

ROBT. C. MUIR,
Assistant Engineer.

WELLINGTON

The County of Wellington adopted the county road system in 1903. It has a county road mileage of 344 miles which is approximately 19.4 per cent. of the total road mileage of the County. In 1916 the road mileage was increased from 330 to the present mileage of 344. Many permanent bridges have been built, the spans varying from 12 to 70 feet, the type mostly used being a concrete truss. 63 miles of stone road have been constructed, being 18 per cent. of the road system.

During 1917, approximately 3½ miles of stone and gravel roads were constructed and 6 large bridges built, together with grade reduction, straightening, widening and raising roads through swamps, and the erection of wooden guard fences where necessary. Much work was contemplated for 1917, but owing to the scarcity of labour the work was either not carried out or left in an unfinished condition. The work carried out was entirely satisfactory. The straightening of the travelled road, in the places carried out, has created a great improvement and much work of this nature will be done in the future, as also will grade reduction. The road drag has been used to a great extent on many of the light gravel roads with very good results. Much work of the nature of municipal drains, piping and ditching has been carried out during the past season.

On a part of the county line road between Grey and Wellington, 1¼ miles long, a sub-base of crushed stone covered with screenings, but not rolled, was con-

structed. This work was largely carried out by gratis labour, the field stone being supplied and hauled to the crusher free of cost. This road was in an exceptionally bad condition prior to the laying of this sub-base and was almost impassable during the spring and fall months. The work has been carried out satisfactorily and will be a great benefit when the proper surfacing is applied. This road carries a heavy traffic to and from a most important shipping and market point.

The roads are built of either gravel or crushed field stone, both of which are plentiful in the County, and the foreman responsible for the construction supervises the maintenance work. During the spring freshets many culverts were washed out and have been replaced with concrete structures of larger dimensions. Both concrete and corrugated iron pipe culverts are used where sufficient to meet the requirements, a slight preference being given the concrete pipe.

All machinery is housed during the winter months. The rollers and tractors are placed in the open and a house built around them, thereby avoiding the cost of insurance if stored in a barn. The rotary screen is lowered into the bin and covered over with boards to protect it from the weather.

The work is carried out under the direction of a County Road Superintendent who appoints a foreman in each section. The foreman keeps a time book and makes out a pay sheet which is countersigned by the Superintendent and the Warden. The Superintendent issues an order on the Treasurer in favour of the foreman, or he issues individual orders for each man. Orders issued to the foreman are accompanied by the pay sheet which is signed by each man opposite his name and returned to the Treasurer. All accounts are submitted to the Road Superintendent to be certified. The accounts are paid by order on the Treasurer, signed by the Superintendent, the Warden, and the Chairman of the Committee. The orders are similar to a check and are cashed by all the banks in the County or they may be presented directly to the Treasurer. The Road Committee consists of the whole Council and meets at the regular meetings of the County Council, but on special work a sub-committee and the Reeve of the municipality in which the work is located, visit the work and deal with the same in conjunction with the Superintendent. This method of paying accounts and the men is found to be entirely satisfactory.

During the past month an Order-in-Council was approved authorizing the appointment of a Suburban Road Commission on roads adjacent to the City of Guelph. The Commission has chosen 31 miles of road and it is understood that no permanent work will be done until after the war. These roads, however, will be kept in a state of good repair.

The County Road Superintendent is Mr. John M. Young, Harriston.

WATERLOO

The County of Waterloo adopted a county road system in 1908. It has a county road mileage of 213 miles which is approximately 25 per cent. of the road mileage of the County. Approximately 86 miles of stone and gravel roads have been built to the end of 1917, which is 40 per cent. of the road mileage under the system. The road system has been extended from time to time in order to meet requirements.

Much of the work contemplated for 1917 was left in an unfinished state on account of the scarcity of labour. During 1917, gravel or crushed stone was spread on the roads to the extent of approximately twenty-one miles. The bridge work carried out in 1917 consisted only of replacing two wooden piers with concrete piers on one bridge, and on another bridge two wooden abutments were replaced

with concrete structures. The majority of the bridges in the County are not of sufficient strength to carry a ten-ton road roller, and will have to be replaced with a modern type of bridge within the next few years. The bridges at present are iron or timber structures.

A cement concrete roadway was built in 1917 on road No. 14, in the Village of Wellesley, fronting the business section. This pavement is 760 feet long, 20 feet wide and 8 inches thick at the centre and 6 inches at the sides. A mixture of one part of cement to five parts of gravel was used throughout, the gravel being obtained from a pit about one mile from the work. The unit cost of the concrete work was 14¼c. per square foot, the grading being done by day labour. No reinforcement was used. The work has been carried out satisfactorily, though a little more care might have been exercised in tamping behind the joints and in a few places the aggregate appears to have been dirty.

The cement concrete pavement laid in 1914, through the Village of St. Jacob's, is in a very good condition, and the residents of the Village are highly pleased with it.

A light application of tar, which was slightly heated, was applied to the surface of the Galt Road from Galt to Preston, ¾ of a mile in length, and covered with pea gravel. A very light application was applied, as this part of the road had already been treated in 1914. From Centreville to east of the Village of Freeport, 2 miles in length, the surface of the road was given a little heavier treatment of tar as this was the first application, the surface being covered with pea gravel; 1¼ miles of this work was carried out on the Kitchener suburban road system. The surface of the road was treated for a width of 12 feet. All holes were first cleaned out and filled with a mixture of tar and stone chippings, the patch being left a little higher than the surface of the road and allowed to be smoothed out by the traffic. This method of patching has given satisfaction. The tar was mixed with the stone chippings in a manner similar to that used in mixing concrete. The Hamilton Road, east of the City of Galt, was also given a surface treatment of tar, ½ mile in length and 12 feet in width. The stone road constructed in 1917, from the town limits of Preston to the Village of Blair, ¾ of a mile in length and 6 feet wide, was given a light coat of tar, as also was a short section through the village. This work is very satisfactory.

Owing to the difficulty of obtaining teams to haul stone at certain periods of the year, it was the practice to deposit as much crushed stone and gravel as possible on the roads when teams were available so as not to hold up the rolling. This practice can be carried to the extreme, in that it leaves too much work for the roller to do satisfactorily and the traffic using the road sweeps the material into the ditch. Also an uneven surface results as too great a depth of stone is rolled at one time. The majority of the gravel roads are requiring to be dragged and much work of this nature will have to be done next spring. The roads that have been dragged are in a very fair condition. The earth shoulders on nearly all the roads are requiring attention, the shoulders should be dragged in order that the surface water may have freer access to the ditches. Gravel and fieldstone are very plentiful throughout the County. In a few instances the crusher has been erected in a gravel pit and the large stone put through the crusher. It is the intention of the Superintendent to continue crushing stone throughout the winter months and to have stone ready for the road in the spring.

During a freshet in the early summer a 20-foot timber bridge was washed out on road No. 26; this has been replaced with a stone fill and the creek diverted. It is the intention to raise the road at this point 5 or 6 feet for approximately 300 feet in length, between the new fill and the existing bridge.

The road from Kitchener to Bridgeport, an exceptionally heavily travelled road, has been regraded and widened in places. This road is to be paved with a more permanent type of surface within the next few years.

Owing to the inability of the Superintendent to obtain a tractor to operate the crusher, a steam roller was used in one instance; this was satisfactory as far as the crushing went, but it left too much work for the roller to do on the road, with the result that part of the work was left unrolled.

Only one concrete culvert was built during 1917, this being an 8-foot one on road No. 29B, built at a cost of \$285. Numerous 12-inch concrete tiles were laid across the road where required.

The highways throughout the County are very narrow, the width between fences varying from 33 to 40 feet in many places. The Council in a few places



BROKEN STONE ROAD UNDER CONSTRUCTION IN WELLAND COUNTY.

have bought strips of land 10 feet wide in order to provide better facilities for drainage.

Maintenance work only was carried out on the suburban roads adjacent to the Cities of Kitchener and Galt. A few of the roads were given a light application of tar. There are 12 miles of road under the jurisdiction of the Kitchener Suburban Road Commission and 20 miles under the Galt Suburban Road Commission.

The work is carried out under the supervision of the County Road Superintendent, who appoints a foreman in each section. The foreman keeps a time book from which the Superintendent makes out a paysheet, which he submits to the Road Committee for approval. When the paysheet is approved by the Committee the Superintendent issues cheques to each man, which are payable at par at any bank in the County. The Superintendent is given an accountable advance and pays accounts and men by cheque after receiving authority from the Road Com-

mittee. All accounts are submitted to the Superintendent, who certifies and submits them to the Committee. When accounts are approved they are signed by the Chairman and the Reeve of the township in which the work was done. There are seven members in the Road Committee, which meets monthly at the call of the chairman.

The County Road Superintendent is Mr. M. D. Hallman, Kitchener.

LINCOLN

The County of Lincoln adopted the County Road System in 1904, when the Queenston and Grimsby Stone Road was approved under the Highway Act, a length of 29 miles. This road extending across the County is one of the most important roads in the Province; in addition to carrying a heavy local traffic it carries a large amount of through motor traffic. This road was originally a toll road and was purchased by the County. During 1916 the county road system was extended to 138 miles, which is 16.9 per cent. of the total road mileage of the County.

Prior to the inauguration of the Government grant for maintenance, the County expended a large sum of money annually on oiling and maintaining the Queenston and Grimsby Stone Road. Many permanent bridges and culverts have been built, and 32 miles of stone road have been constructed to date, being 23 per cent. of the road system. In 1916, 2 miles of tar penetration road, 18 feet wide, were constructed, together with the improvement of a most dangerous hill. This road received a light cold application of tar during the past season.

During 1917, 24 miles of clay roads were graded, the work being classed as construction as it included the reducing of grades, straightening and widening of the road-bed. This work was carried out satisfactorily. A 20 h.p. gasoline tractor operated the grader on the larger part of this work and was found to be more economical than horses.

The improvement carried out during the past year on the east hill near Jordan, which was a most dangerous hill on account of the bad curves and the narrowness of the road, was only partly completed. The work consisted of cutting back a side hill for a distance of approximately 10 feet, and the road widened throughout. A sharp corner was cut back and a concrete curb and gutter was laid on the south side of the road. A 5-inch tile drain was laid under the gutter for the entire length of the hill. This hill was intended to be resurfaced throughout with a 3-inch tar penetration top, but the work was started too late in the year and was stopped on account of the frost during the first week of December. On account of the dangerous nature of the curve at Jordan a dummy policeman has been erected, requesting traffic to keep to the right; a light is placed on this standard at night. This means of warning the motorists has been found to be satisfactory. The work on this hill will be completed in 1918.

A great improvement was created on Road No. 12 at the crossing of the 15-mile creek. The old bridge was taken down and replaced by a steel structure of 60-foot span, the concrete abutments were raised 2 feet and a concrete retaining wall built. The approaches were raised and widened, the necessary material being obtained from the grade reduction at this point.

Two bridges, steel beam span, were constructed during the year, a 20-foot span with concrete posts and iron pipe rail. The width of the roadway is 20 feet. Many concrete slab culverts, varying from 4 to 10-foot spans, were built during the year. A large number of 12-inch corrugated iron pipe culverts were laid where sufficient to meet the requirements.

There was very little work carried out on construction of stone roads in 1917, only $\frac{1}{2}$ mile being built at St. David's on road No. 17.

Approximately \$33,000 was expended in repairing and maintaining the Queenston and Grimsby Stone Road, known as County Road No. 1. Eighteen miles of stone road were spiked up, harrowed and in many places new stone was added and the whole rolled as in construction. This work was satisfactory, but at its best is only good for one year. It might be advisable to mention here that in carrying out work of this nature care should be taken not to disturb the natural foundation. Where there is an insufficient depth of stone on the road the existing surface should be left intact and new stone added 4 to 5 inches deep and rolled as in construction.

A light surface treatment of 40 per cent. asphaltic oil was given the Queenston and Grimsby Stone Road for almost its entire length. Holes of any appreciable size were cleaned out and filled with a mixture of tar and stone chippings.

It is the intention of the Superintendent to reduce the rock grade and widen the road on a section of Road No. 5, south of Vineland, by quarrying and crushing the rock during the winter months. The crushed stone will be used as a sub-base on another part of the road.

The County now owns a large plant, the chief units of which are: 2 steam rollers, 1 gasoline tractor, 1 asphalt air pressure distributor, 1 oil distributor, 1 steel water tank. The housing of machinery during the winter months is of great importance and under no circumstances should machinery be exposed to the weather during these months.

During the year the following units of machinery were purchased: A 12-ton "Sawyer-Massey" steam roller at a cost of \$3,300; a 20 h.p. gasoline tractor. "Sawyer-Massey," at a cost of \$2,280; an oil distributor at a cost of \$515, and a steel water tank of 430 gallons capacity at a cost of \$185. The asphalt distributor "Climax," purchased in 1916 at a cost of \$1,145, has been very little used.

Owing to the scarcity of labour during the past year it is purposed to appoint a gang at the beginning of next season to do all the concrete work in connection with culverts and bridges. It is expected that more satisfactory work will result from such a procedure.

The work is carried out under the direction of a County Road Superintendent, who appoints a foreman in each section. The foreman makes out a paysheet from his time book every two weeks and submits same to the Superintendent. After the paysheet is certified by the Superintendent and countersigned by the Chairman of the Road Committee, it is forwarded to the Treasurer who issues individual cheques to the men. All accounts are submitted to the Superintendent to be certified, and an order for payment, signed by the Chairman of the Road Committee and the Superintendent, is issued to the Treasurer, who pays same by cheque. There are six members in the Road Committee who meet at the call of the Chairman.

The County Road Superintendent is Mr. Peter Robertson, Beamsville.

HALDIMAND

The County of Haldimand adopted the County Road System in 1911. The road mileage under the system is 125 miles, which is 14 per cent. of the total road mileage in the County. Many permanent bridges and culverts have been built and 20 miles of stone road have been constructed to date, being 16 per cent. of the road system.

During 1917, one and one-quarter miles of stone road were constructed on the Hamilton Road from the limits of the Village of Caledonia northerly. This was

the only construction work carried out during the year. Many miles of clay roads were graded and put in pretty good shape. The clay roads in this county are very difficult to keep up; with a little rain they are made almost impassable, but when dry and smooth they are excellent roads to travel over. The Superintendent, about the beginning of November, issues a notice to each of his foremen, requesting that all clay roads be gone over with the drag and that all culverts, ditches and outlets be cleaned out and left in good condition for the winter.

The work of reducing a steep grade and widening the road-bed on Road No. 1, 6 miles east of the Village of Jarvis, was partly completed during the season. This will be a marked improvement when completed.

The stone quarries belonging to the County have not been in operation for the



SINGLE TRACK STONE ROADWAY, COUNTY OF WELLAND.

The deepening wheel-tracks indicate the need for more systematic maintenance; also that traffic is such as to require a wider stone roadbed, thereby distributing wear.

past two years on account of the high cost and scarcity of labour. The stone used on work carried out during the past season was imported from Dundas.

In building the stone roads it appears that too great a depth of stone is rolled at one time and insufficient bonding material and water are used in consolidating the stone. The earth shoulders should be kept as smooth as possible in order that the surface water may have freer access to the ditches. The hauling of material over the loose stone or during the rolling process should be avoided as far as practicable, and the work should be laid out to prevent this.

The method adopted in unloading the stone from the cars and loading the wagons was rather a novelty; a trench was cut between the rails and the stone dumped through the pockets in the bottom of the car into the trench, the stone being conveyed from the trench to the wagons by means of an elevator and chute, the elevator being driven by a 6 h.p. gasoline engine. This method worked very

satisfactorily and without interference to anything, the end of the siding being used for the purpose, the car, when necessary, being moved so that a pocket would be over the trench. A wagon of two cubic yards capacity was loaded in three minutes and two 50-ton cars were unloaded in a day. The entire outfit consisting of an engine, elevator and bin, and the erection and taking down of same, cost approximately \$260. The elevator was an old one taken from a crushing outfit.

The County owns a large outfit, the chief units of which are 2 steam rollers, 2 steam traction engines, 10 spreading wagons, 3 quarrying and crushing outfits, together with small implements.

The work is carried out under the supervision of a County Road Superintendent, who appoints a foreman in each section. The foreman keeps a time book from which the Superintendent prepares a paysheet, which is signed by himself and the Warden and submitted to the Treasurer, who issues cheques to each man. The cheques are sent to the foreman who distributes them to the men. The paysheets do not come before the Council. All accounts are submitted to the Superintendent who places them on the distribution sheet, signs the same and submits it to the County Road Committee who recommend it to the County Council for payment. The accounts are paid on resolution of the County Council. The distribution sheet is forwarded to the Treasurer who pays accounts by cheque. Original accounts are filed by the County Clerk. The County Road Committee consists of seven members who meet at the call of the Chairman and at the County Council meetings.

The County Road Superintendent is Mr. D. W. McBurney, Hagersville.

SIMCOE

The County of Simcoe adopted the County Road System in 1903. It has a county road mileage of 420 miles which is 15.5 per cent. of the total road mileage of the County.

Many large and permanent bridges have been built, both steel and concrete structures being erected, and approximately 300 miles of stone and gravel roads have been constructed to date which is 21.1 per cent. of the road system. Owing to the light character of surfacing carried out, many of the roads require resurfacing.

During 1911, three miles of stone and gravel roads were constructed and also two concrete slab bridges and four large concrete culverts were built. One 8-foot concrete arch culvert, 53 feet long, was built on Road No. 3, the towline between Essa and Innisfil, replacing a wooden box culvert, the road-bed at this point being widened, the extra material being obtained by reducing the grades of the approaches. The widening of the road-bed and the reducing of the grades have been a great improvement. A wooden guard rail will be erected when the fill has settled. On Road No. 28 the road-bed has been widened on lot 40, Con. XI, Oro. At this point the creek runs parallel to the road and within the right-of-way for a length of approximately 150 feet, and during a freshet last spring a part of the road-bed was washed away. The creek was diverted, being moved over 15 feet, and the road-bed widened 10 feet, the necessary material being obtained from a side hill. The new bank is protected with stone boulders. A wooden guard rail will be erected when the fill has settled. This was a very dangerous point, the road was narrow and the bank was liable to slip at any time. During the past spring numerous culverts have been washed out; these have now been replaced with either a concrete slab culvert or a corrugated iron pipe. The concrete work in connection with the culverts and bridges is satisfactory, though in places a little

rough; and more care might have been exercised in erecting the concrete posts. This work was carried out by day labour; in one case the work was done on a 10 per cent. basis. Numerous corrugated iron pipe culverts were laid during the year varying in size from 12-inch to 42-inch diameter.

One mile of stone road was built on Road 24b two miles south of the Town of Midland, 10 feet wide and 8 inches deep; crushed field stone, crusher run, was used. A 12-ton steam roller was rented from Midland, as also was a water tank. Owing to the scarcity of screenings, sand was used as the bonding material. As in the case of some of the other counties too great a depth of stone has been rolled at one time and insufficient water has been used in consolidating the stone. Many of the gravel roads are requiring to be dragged, as much of the material is swept into the ditches by the traffic. Special care should be taken in depositing gravel on the road, as too great a depth of material is a source of danger to the users of the road. The road drag should be used more frequently on the roads and the gravel swept to the sides of the road dragged to the centre. The majority of the roads carry light traffic and are only given a light coat of gravel. Since the construction of the military camp at Borden the traffic on some of the roads has increased almost three-fold, not to speak of the weight and kind of traffic. This traffic has cut up the roads very much, thus showing that a better type of construction is necessary on some of the more important roads. These roads now require repairing, and a systematic repair and maintenance organization should be established.

It is absolutely essential that the County purchase sufficient outfits at an early date if the work is to be carried out satisfactorily and at the same time meeting the requirements of the Department.

The work is carried out under the direction of a County Road Superintendent who appoints a foreman in each section. The foreman keeps a time book from which he prepares a paysheet, which is issued to the Superintendent for approval, then forwarded to the Treasurer for payment; individual cheques are issued in most cases, but at times a cheque for the full amount is sent to the foreman who pays the men in cash. The pay sheets are often signed by two members of the Road Committee instead of the Superintendent. Only some of the accounts are submitted to the Superintendent for approval, others are approved by two members of the Road Committee. The accounts are paid by cheque on order from the Superintendent or from two members of the Road Committee. The Superintendent should in all cases certify the paysheets and accounts. There are twenty-seven members in the County Road Committee who meet at the regular Council meetings, but on special work a sub-committee, consisting of the Chairman of the Road Committee and two members of the Committee closest to the work visits the work and deals with the question in conjunction with the Superintendent.

The County Road Superintendent is Mr. F. G. Campbell, Barrie.

FRONTENAC

The County of Frontenac adopted the County Road System in 1907, when the Kingston and Perth Toll Road was purchased, the remainder of the toll roads being purchased later. It has a county road mileage of 160 miles, which is approximately 24.4 per cent. of the total road mileage in area covered by the County Road System. The northern section of the County is not included in the system. The system has been changed and extended at various times, the last extension being in 1916. Many permanent bridges have been built and 76 miles of stone road have been constructed to date, being approximately 48 per cent. of the road

system. This County is most favourably situated with respect to road-building material. Limestone of a good quality can be obtained almost at any point in the County, thus reducing hauling costs to a minimum. The work accomplished in this County is very satisfactory. Care is taken in obtaining good alignment.

During 1917, approximately 5 miles of stone road were constructed and one 15-foot concrete slab bridge with stone masonry end walls; and also five concrete arch culverts of 5-foot span were built. Approximately 2 miles of stone road were constructed on Road No. 6, through the Village of Battersca. Prior to the laying of the stone the grades were reduced and hollows filled, in places four feet, also widening and straightening the road-bed. The crushing outfit was right on the work, the stone crushed being taken from the side of the road and from the grade reduction. The width of stone surface is 10 feet, this being increased to 18



A NEWLY FINISHED GRAVEL ROAD IN PRINCE EDWARD COUNTY.

feet through the village. There are twelve concrete tile culverts laid in this section, varying from 8 to 15-inch diameter and 30 to 40 feet in length. At two intersections the roadway has been widened and much improved. Catch-basins are being placed at convenient points through the village. On Road No. 6a, near Sunbury, a bad grade has been reduced and a dangerous curve eliminated. A 24-inch concrete tile, 30 feet long, was laid at this point. On Road No. 11, about $\frac{1}{2}$ mile east of Sydenham, work of the nature of hill cutting, widening and straightening the road-bed is proceeding; a 10-foot cut at the top of the grade has been made. At this point a 24-inch diameter concrete tile, 45 feet long, has been laid. All the work of reducing grades and eliminating bad curves necessitated the quarrying and taking out of rock. Much work of this nature is to be carried out within the next few years. All this work has been carried out satisfactorily and has created a great improvement. A large number of concrete tile culverts varying from 12 to 24-inch in size and 30 to 60 feet in length have been laid during the

year. The majority of the roads have been repaired and put in fairly good shape. Up to the present no special system has been established for the maintenance of the roads, the foreman supervising the construction work being also responsible for maintenance. Within another year or two some system of maintenance will be adopted. The concrete work on the bridges and culverts is most satisfactory, a smooth and well finished job being obtained.

The Commission on suburban roads adjacent to the City of Kingston was appointed in 1916 and work commenced in 1917. There are 60 miles of road under supervision of the Commission and including the seven roads leading into the City, all of which are either market roads or roads used extensively by city motorists. Several new roads, forming belt lines, were taken over by the Commission. On road No. 1 from the City limits westerly, the road has been graded and stoned for approximately $\frac{1}{2}$ mile in length and 20 feet in width. This work is satisfactory with the exception that provision should have been made along the street car tracks for the surface water to get to the ditch. A surface treatment of oil or tar will be applied to this stretch of stone road in 1918. This road, from lot 10 to lot 19, approximately 2 miles long, has been graded, widened and prepared to receive stone. Stone would have been applied during the past season but was delayed on account of insufficient funds. A little reshaping work will be necessary on this road next year. Two concrete tile culverts, 12 and 15-inch diameter, 20 and 30 feet long, were laid on road No. 1a. On road No. 2 a little west of Collins' Bay the road has been widened and a dangerous curve eliminated by cutting away part of a rock sidehill. This road has been graded for approximately $1\frac{1}{2}$ miles in the vicinity of Collins' Bay, and numerous 12-inch concrete tile culverts have been laid. On road No. 2, north of Collins' Bay, several concrete tile culverts have been laid. A few concrete tile culverts have been laid and a little grading carried out where necessary on the other roads under the suburban area Commission. All the construction work carried out during the past season is satisfactory. Maintenance work to a large extent has been carried out on the majority of the roads under the Commission, the work being of a satisfactory nature.

The work is under the supervision of a County Road Superintendent who appoints a foreman in each section. The foreman keeps a time book from which he makes out a paysheet. The paysheet is submitted to the Superintendent who certifies and submits same to the County Road Committee. The accounts are paid by cheque by the Treasurer on order of the Superintendent, countersigned by the Chairman of the Road Committee. There are five members in the County Road Committee, consisting of the Reeves of the townships covered by the system, who meet at the call of the Chairman.

The County Road Superintendent is Mr. R. H. Fair, Kingston, R.R. No. 5.

PEEL

The County of Peel adopted the County Road System in 1916. It has a county road mileage of 127 miles, which is 14 per cent. of the total road mileage in the County. The County Road System has been revised and extended at various times to meet conditions. Many permanent concrete bridges have been built, the spans varying from 12 to 50 feet, and 98 miles of stone and gravel roads have been constructed to date, being approximately 77 per cent. of the road system.

Very little work was carried out during the past season on account of the scarcity of labour and lack of transportation for materials.

During 1917, approximately $3\frac{1}{4}$ miles of gravel roads were constructed and 4 miles graded, on a part of which a gravel sub-base has been laid. One 32-foot concrete beam span bridge and two concrete culverts, 5 and 8-foot span, have been built. On gravel roads the practice is to lay a sub-base of 5 inches of coarse gravel. In places large stones taken from a creek are used, on which is spread a 6-inch layer of finer gravel and rolled. A horse roller is sometimes used to consolidate the sub-grade and sub-base. Many of the roads in this County are too narrow, though the tendency now is to widen them. The roads are well graded prior to the laying of the sub-base.

During the early part of 1917 the two main roads in the County, Dundas Street and Hurontario Street, were approved by the Department as provincial county roads. The work on these two roads consisted only of repairs at exceptionally bad places. On Dundas Street, in the vicinity of Dixie and Cooksville the surface of the stone road has been loosened and new stone added and rolled. It is the intention of the County Council, at an early date, to resurface the part of this road from Summerville to Cooksville, with a more permanent type of surfacing. On the work of picking up and loosening the stone surface it is always advisable to have two rollers on the job, one picking up and the other rolling. More satisfactory work is obtained and the work proceeds much more quickly. Several corrugated iron pipe culverts have been laid, varying from 12 to 30-inch diameter and 18 to 28 feet in length.

On the approaches of several bridges where a fill has been necessary it is the intention of the Superintendent to widen the approaches and make an easy side slope, thus avoiding the erection of a guard rail.

The work is carried out under the direction of a County Engineer, who is employed by the day, and who appoints a foreman in each section. The foreman keeps a time book and makes out a monthly paysheet which is submitted to the Engineer. The Engineer certifies the paysheet and submits it to the County Road Committee for approval: when approved the paysheet is submitted to the Treasurer who issues cheques to each man. All accounts are submitted to the Engineer, after being certified by the foreman. The accounts, after being certified by the Engineer, are submitted to the Road Committee for approval. When approved a detailed statement is made out by the Engineer and issued to the Treasurer for payment. The Treasurer issues cheques to each party on the statement submitted by the Engineer. The Road Committee consists of five members, the reeves of each township in the county, who meet at the call of the Chairman one day of the first week in every month.

The County Engineer is Mr. C. R. Wheelock, Orangeville.

PERTH

The County of Perth adopted the County Road System in 1907. It has a country road mileage of 207 miles, which is approximately 16.5 per cent. of the total road mileage of the County. The system has been extended at various dates. During 1917, the two roads through the Town of Listowel, under the County Road System, were struck off the system at the request of the Town. Many permanent bridges have been built and 105 miles of stone and gravel roads have been constructed to date, being approximately 51 per cent. of the road system.

During 1917, approximately 14 miles of stone and gravel roads were constructed and two 16-foot reinforced concrete slab bridges and one 5-foot concrete box culvert were built. The bridges were only partly completed. The majority of the roads consist of 5 inches of crushed field stone as a foundation and about 5

inches of gravel surfacing consolidated in many places by a steam roller. With the exception of Huron Road, the main road from Stratford to Mitchell, the stone or gravel roads are in good condition. This road is very wide and flat and demands immediate attention. During the past season approximately 5,700 feet of tile drain were laid on the road, varying in size from 1 to 10-inch. Approximately, $2\frac{1}{4}$ miles of tile drain were laid in 1917 on roads Nos. 17, 26, 35, 51 and 54, varying in size from 4 to 12-inch; tile were laid in some places on both sides of the road. The nature of the subsoil, which is a heavy clay, and the land being practically level demands under drainage and large ditches. Drainage work, to a large extent, is carried out annually. A light cold application of tar has been used on many of the roads through villages for the past few years. Many concrete and corrugated iron pipe culverts were laid in 1917, varying in size from 12 to 30-inch



ON THE HAWKESBURY-L'ORIGINAL ROAD.

Constructed in 1917 by the County of Prescott and Russell.

diameter. Gravel and field stone are very plentiful in some of the townships, but in some instances stone has been imported from Dundas or St. Mary's. The majority of the roads constructed during the past season will have to be dragged next spring and the earth sides drawn in to hold up the gravel. The bridges and culverts erected in 1917 are substantially built. The railing used on the culverts consists of two $1\frac{1}{2}$ -inch iron pipes supported by $3\frac{1}{2}$ -inch x 4-inch iron angles. Maintenance work, to a large extent, has been carried out satisfactorily on the most important roads.

The work is under the supervision of a County Road Superintendent, who is also County Engineer. Each foreman, appointed by the Engineer, keeps a time book from which he prepares a paysheet. The paysheet, signed by the foreman, is submitted to the Engineer for approval, who forwards it to the County Clerk, who issues an order, signed by himself and the Warden, to the Treasurer for payment.

Individual cheques are issued. All accounts for materials are forwarded to the foreman who signs and submits same to the Engineer. A statement is made out by the Engineer, and signed by himself and the foreman, giving the name and address of the contractor, road number, location, material supplied and the amount. This statement is forwarded to the Clerk, who issues an order for the full amount to the Treasurer for payment. The order is signed by the Warden and the Clerk. Individual cheques are issued to the parties shown on the statement. The Road Committee consists of ten members, who meet at the call of the Chairman. On the first Saturday of each month the Engineer holds a conference with all the foremen and all work is discussed.

The County Engineer is Mr. John Roger, Mitchell.

LANARK

Lanark was one of the first counties to adopt a County Road System, commencing in 1903 with the purchase of several toll roads, followed by the first steps in construction in 1904.

The original county road system comprised 98 miles, covering all sections of the County except the Townships of Montague and North Elmsley. This comparatively small mileage was completed in 1914, and in 1915 an addition of 12 miles was designated in the Township of Montague. In 1916 the system was practically doubled by extensions throughout the County, including North Elmsley Township. The total mileage of county roads is now approximately 230 miles, or 18.8 per cent. of the total road mileage of the County.

Construction work for 1917 consists of the section of about 5 miles on road No. 28, between Carleton Place and Almonte, of grading and re-surfacing with crushed limestone, and a bridge across the Mississippi River on road No. 1, south of Lanark Village. In addition to the foregoing construction work several sections of road formerly constructed have been re-surfaced. The County has instituted a commendable system of maintenance, whereby it is attempted to re-surface a definite mileage each year in an attempt to keep the roads already constructed up to a fair standard.

The road material available in Lanark County consists principally of field stone and quarried limestone. The County is well supplied with material of either of these varieties, practically no long hauls being necessary. All the roads in the original system of 98 miles were constructed without the use of a roller. Special attention, however, was given to the stone during the process of consolidation. Ruts were kept filled by grading or raking into them stone which became scattered. This was kept up until the road was thoroughly consolidated, usually about one year, the result being a system of roads which compares favourably with many other roads on which a roller had been used. This method, which would not be permissible in many other counties, was practicable in Lanark owing to the comparatively light traffic of many of the county roads. Even on such heavily travelled roads, however, as the road between Lanark Village and Perth (originally a toll road), the result is a particularly solid, although somewhat rough, road.

County road work is under the direction of a committee of five members of the County Council. This committee does not meet at regular intervals, but as occasion requires. All work is under the direct supervision of the County Road Superintendent. Accounts for material, etc., are submitted in all cases to the Road Superintendent, who issues to the firm or individual presenting the account an order on the County Treasurer, countersigned by the Chairman of the County

Road Committee, by whom all accounts are examined. These accounts are then paid by cheque on presentation to the County Treasurer of the Superintendent's order. Pay lists are made out, signed by the foreman, certified by the Superintendent, countersigned by the Chairman of the County Road Committee and submitted to the Treasurer, who issues a cheque to the Superintendent for the full amount of the paysheet. The Superintendent makes out pay envelopes and pays the men personally.

The County Road Superintendent is Mr. Wm. Watters, Carleton Place.

YORK

The County of York adopted the County Road System in 1911, which consisted of the main roads in the Townships of York, Scarborough, Etobicoke, Vaughan and Markham, an agreement having been made between the County and the City of Toronto, whereby the City would contribute one-third of the cost of construction. Prior to 1917, the mileage of roads under the System was 118 miles which at the end of 1917 was almost completely constructed. The roads in the System include the main roads radiating from the City of Toronto, many of which are the most heavily travelled roads in the Province. These roads, under township care, had fallen into disrepair, owing to the increasing traffic, both in volume and character.

During 1915, the County Road System was extended from 118 to 222 miles, being 15.7 per cent. of the total road mileage of the County. The added mileage is almost wholly in the northern part of the County, not previously in the System.

Various types of road have been constructed in addition to macadam roads, these including brick on concrete foundation, asphaltic concrete, cement concrete, tar penetration and tar surfaces. The class of construction varies with the requirements of traffic. The brick pavement is laid where the road is subjected to heavy teaming. The greater part of this type of paving is laid on hills.

The roads are subjected to such a heavy traffic that constant and careful maintenance is necessary. The completed stone roads, therefore, receive an annual treatment of tar, covered with a light coat of sand. This treatment has given satisfactory results.

Many concrete bridges of a substantial nature have been erected, the spans varying from 12 to 70 feet. These have all been designed with a view to appearance as well as durability.

During 1917, approximately 5 miles of tar penetration roads were constructed with a width of 18 feet; also 4 miles of asphaltic concrete surfacing, 2 inches thick and 18 feet in width, with 3-foot asphalt penetration shoulders; one-fifth of a mile of brick pavement on concrete foundation, 18 feet wide; 3 miles of water-bound macadam, 15 to 20 feet in width, together with a large number of concrete slab culverts under 10 feet span. In addition to the foregoing construction work several sections of the road formerly constructed have been given a surface treatment of tar and sand.

The toll road on the Holland Landing Road, in the vicinity of Bradford, was purchased in 1917, by the County, this being the last toll road in the County of York.

The work is under the supervision of a Board of Commissioners, composed of five members, three from the County and two from the City, and is known as the Toronto and York Roads Commission. The Commission meets twice a month. All accounts are submitted to the Engineer who classifies same and submits them to the Commission. The accounts are countersigned by the Chair-

man and paid by cheque from the Treasurer's office on order of the Engineer and the Commission. The men are paid in cash, pay envelopes being prepared in the Treasurer's office and distributed through the various foremen.

The County Engineer is Mr. E. A. James, Toronto.

TORONTO, December 19th, 1917.

W. A. McLEAN, Esq.,

Deputy Minister of Highways,

Parliament Buildings, Toronto.

SIR,—During the season of 1917 I inspected the county road work in the following counties and beg to submit the following report.

CARLETON

The County of Carleton adopted a County Road System in 1909. It has a county road mileage of 277 miles which is approximately 18 per cent. of the total road mileage of the county.

The work is under the supervision of a County Road Superintendent who appoints foremen in each township. The foreman keeps a time book and submits a time sheet to the superintendent for his approval and signature. After being countersigned by the reeve of the municipality in which the work is being done, it is forwarded to the treasurer. The treasurer issues a cheque to the foreman together with the payroll. The foreman pays the men, secures their signature and returns the payroll to the treasurer.

Roads are built of both gravel and broken stone. Much of the gravelling in the north-west townships of the county is done during the winter, when work on the farms is light and when wages of teams and men are not high. Snow is shovelled from the road-bed and the gravel placed in the trench made. In the spring the metal is graded and shaped up so that traffic will consolidate it evenly.

During the spring of 1917 several jobs of building broken stone roads were contemplated. This work was not all finished. Two jobs had to be left owing to shortage of labour and also to lack of equipment. The county bought some new machinery and it was not only delayed in delivery but also much adjustment was found necessary before it would run satisfactorily. Before the work was completed the winter set in and the road was left unfinished.

Several bridges were also built. Graham's Bridge on Road No. 1 has concrete abutments on a pile foundation. It is built with I-beams and has a concrete floor, curb and railing. Padgett's Bridge on Road No. 5a is a steel truss on concrete abutments. The concrete in the curb does not appear to be good and it should be carefully watched to detect any defects.

Green's Creek Bridge on Road No. 9 is built of steel I-beams on concrete abutments. Hill cutting and filling has reduced the grade considerably and tree trimming has improved the line of vision, changing that section of road from a dangerous condition to a relatively safe one.

The concrete in a new bridge of 15 ft. span in Nepean Township on Road No. 4, Lot 23, Cons. I and II is not satisfactory and should be carefully watched to ascertain if it will stand up.

The maintenance work is in the hands of the same foreman who is in charge of the construction in each township. It is not systematically carried out. The bad places in the road are repaired, but only when they become very bad.

Improvements could be made in that section of the county where roads are built of stone if the superintendent were to have permanent gangs under a steady foreman. They could go from job to job and be improving all the time. In Nepean Township this idea is partly carried out. The township road superintendent is also the county foreman and he employs his men the whole season through. The main objection to this is that the county work may have to suffer on account of the township or vice versa.

The Road Superintendent was formerly paid by the day for such time as he



CONCRETE BRIDGE CONSTRUCTION.

Placing footings for concrete bridge, on the Provincial Highway.

was on the county road work and the time charged to the particular work he found it necessary to visit. A most necessary change has been made this year in that he is now paid out of general account, provided with a motor car so that he can travel continuously on the county roads and is thus able to keep a close supervision over the whole system.

LEEDS AND GRENVILLE

The United Counties of Leeds and Grenville adopted a county road system in 1910 and have about 270 miles of county roads, which is about 15 per cent. of the total road mileage of the county.

The original county system was very disconnected. The roads first assumed were in the vicinity of the different towns and villages. Traffic conditions have so changed during the past few years that they have found it necessary to connect up some of the broken ends. During 1917 under by-laws of the Counties' Council,

several important additions were made and if this idea is followed during the next season they will soon have a well connected system.

The work is under the supervision of an engineer who consults with a committee of three as to the general policy of the county road work.

This committee meets monthly or at the call of the chairman. Also, the chairman of the committee and the reeve of the municipality where the work is being done meet every Thursday to pass accounts, etc.

All accounts and paylists are certified by the engineer and approved by the reeve of the township. The chairman then issues an order on the treasurer who pays the account, or if it is a payroll sends a cheque to the foreman who pays the men and returns the payroll to the treasurer.

Practically all roads are built of crushed field stone or crushed quarried stone. Last season very little work was done owing to the shortage of labour. About two miles of stone was laid on Road No. 42, but it was so late in the season that it could not be properly rolled. Part of this was across a swamp and when an outlet is made for the drainage this section of road will be greatly improved.

On road No. 33a just south of the Village of Elgin, a steep rocky hill was cut down and the low road-bed at the bottom was raised. In the Village of Elgin where the road was narrow and rough, a rocky knoll was cut off and the road was widened, making a great improvement.

In the Village of Kemptville the street leading from the main street of the village to the station was widened and filled, and tarvia was applied, giving very good results and improving the appearance and safety of this thoroughfare.

A most interesting piece of construction is contemplated for next season. On road No. 5, known locally as the Lyn Road, there is a very dangerous level crossing over the Grand Trunk Railway. In the hearing given by the Railway Board to a committee of the County Council, the County Engineer was able to show the Board that by deviating two roads and building a subway crossing about 300 ft. east of where the present level crossing is, this dangerous situation could be relieved. The Railway Board agreed and made the following apportionment of cost:—

Grand Trunk Railway	50%
Subway Fund	20%
Township of Elizabethtown	15%
United Counties Leeds and Grenville	15%

The Government Grant on the county share is 40% of 15% = 6%, which leaves the county 9% of the cost of the subway. This is an excellent argument in favor of a County Road System for subway construction.

Maintenance is carried on where and when it is absolutely necessary. As a large condensed milk factory is being built in Brockville, the roads leading from the town have much heavy milk waggon traffic to bear and they need continuous maintenance.

When labour conditions right themselves, this county should pile plenty of repair material near the already metalled roads and adopt a plan of systematic maintenance for their main travelled roads.

LENNOX AND ADDINGTON

The County of Lennox and Addington adopted a County Road System in 1906. It has a county road mileage of 160 miles which is approximately 20 per cent. of the total road mileage of the townships that are included in the County Road System.

The work is under the direction of a County Road Superintendent. There is no Road Committee, but the work to be done in any municipality is done after consultation with the reeve of that municipality. All accounts are submitted to the Road Superintendent and are forwarded to the treasurer after being signed by the Warden and Clerk. The accounts are paid by the Treasurer on the order of the Road Superintendent, countersigned by the Warden and Clerk.

Men are paid slightly differently in this county as compared with other counties. The Road Superintendent is given an accountable advance of \$600.00 for payment of wages, etc. Paylists and pay envelopes are made out by the Superintendent from the foremen's time books and men are paid through the foremen. On the order of the warden and clerk an amount equal to the total of the paylists is repaid to the superintendent, thus keeping the total advance at \$600.00.

An outfit with men steadily employed goes from job to job and by managing the work in this manner the labour situation is not as hard to control. During the past two years this county has not gone into construction very extensively; in the season of 1917 it built about one and a half miles of macadam road and one small bridge.

Owing to the fact that each township is charged with the cost of the work done in that particular township, and because no money is raised by debentures, and as very little is raised annually for construction, there are no very long sections of road built in any one year and the machinery is moved long distances from job to job. This manner of doing work does not lend itself to economic construction. As the debenture debt of the county is negligible, it would appear to be good business for them to raise money enough to build a substantial section of road or reasonable length before moving to other parts of the county.

Up to the year 1916 very little maintenance work was done but they have recently done work that was absolutely necessary. There is need in this county for a more systematic maintenance system.

HASTINGS

The County of Hastings adopted a County Roads System in 1904. It comprises 505 miles of county road which is about 35 per cent. of the total road mileage of the county, and is too extensive for best results to the county.

The work is under the direction of a County Road Superintendent who consults with a Committee of five with regard to the general policy of the county road work. Pay sheets signed by the foreman are sent to the County Road Superintendent. He, with the County Treasurer, checks it, makes a copy of it in a book and files the time sheet. The Treasurer makes out a cheque for the amount of the time sheet and gives it to the County Road Superintendent, who is bonded. The Road Superintendent pays the men in cash and they sign the book into which the names on the pay sheet were copied.

Many expensive bridges have been built in this county. The roads are constructed of gravel in most cases as the county is not well enough equipped with machinery to build broken stone roads. During the past season little or no construction has been carried on, partly owing to labour conditions and partly

because the county council does not pay the men prevailing wages in that vicinity.

The Road Superintendent has no car and has approximately 500 miles to oversee. It is evident that he cannot possibly cover the roads as they should be covered, by means of train and horse and buggy.

The county has one stone crusher, but no bin and screen. It would seem advisable that they should equip themselves more adequately with proper road machinery before any standard road work is contemplated.

PRINCE EDWARD

The County of Prince Edward adopted a County Road System in 1907. There is a county road mileage in this county of 130 miles which is approximately 21 per cent. of the total road mileage of the county.

The work is under the supervision of a County Road Superintendent. He consults with a Committee of three as to the general policy of the work, and this Committee meet at the call of the Road Superintendent. Accounts are submitted to and certified by him, and after being countersigned by the warden and chairman of the County Road Committee, they are submitted to the Treasurer who pays them on the order of the warden, chairman of Road Committee and Road Superintendent.

The foremen submit a time sheet to the Road Superintendent and an order signed by the Road Superintendent and chairman of the Road Committee is given to the Treasurer for the amount of the time sheet. The Treasurer issues a cheque in favor of the Road Superintendent who cashes it and makes out individual pay envelopes which are distributed through the foreman.

This county is unique in that in the beginning they started to construct from Picton, the County Town and shipping point. The result is that there are continuous stretches of well built macadam roads radiating from Picton in all directions. Money was raised by a debenture issue and by working about three gangs (who lived in a caboose on the job) through the whole season, creditable results were obtained.

Owing to shortage of labor during the last season, very little construction was contemplated or carried out. On road No. 16 in the Township of Ameliasburg about two miles of gravel road was built. The grading and the first layer of gravelling was done in the season of 1916 and consolidated by traffic. In 1917 the second layer of gravel was put on, spread evenly, wetted and rolled. The advantage of building a gravel road in this way is shown when the roller is used the second season, as no depressions appear and the sub-grade is solid.

Maintenance work in Prince Edward County has now become a large factor in their annual expenditure. In order to obtain a large mileage during the first few years of construction, stone was not placed sufficiently thick to make the road last a reasonable length of time. Much of the road that was first built has to be re-surfaced with a layer of stone four or five inches in thickness. Also, the stone in Prince Edward County is not as hard as other road building limestone and wears out more readily. There are sections of county roads where the road surface is in good condition except for the two wheel ruts. A road in this condition is repaired there in the following manner:—

The rut is first well wetted with water and crusher run of stone is added to it. The stone is then rolled tightly into the ruts and water is sprayed over the whole road. The puddle of limestone dust and water which is thus formed is brushed into the ruts making a kind of mortar to hold the new stone. The road is allowed to dry out a little and is then rolled. If the work is properly executed, good results are obtained.

Except for a gap of two miles and a half on the main road from Belleville to Picton, and a gap of about five miles from Wellington to Bloomfield, the Prince Edward County road system is well distributed and appears to serve the best interests of the people of the county.

HALTON

The County of Halton adopted a county road system in 1907. The county road system is comprised of 169 miles, which is about 25 per cent. of the total road mileage of the county.

The work is under the supervision of a County Road Superintendent who consults with a Committee of four who are the reeves of the four townships comprising the county, where the work shall be done for the season. All accounts submitted to the Road Superintendent, after being certified by the Superintendent and the Warden, are forwarded to the Treasurer who pays them by cheque. Pay-lists signed by the Warden and Road Superintendent are submitted to the Treasurer who issues a cheque to the foreman to cover them.

Halton County is comprised of four townships and each township has its own road machinery. By this means it is possible to operate four gangs of men at the one time. Because Nassagaweya Township has plenty of local material, the county roads in that township are practically all constructed. Nelson Township, to the south of Nassagaweya, has some local material, but it is found to be a long haul to some of the jobs. Esquesing has a little road material in the north, but in the south, and in Trafalgar Township, there is absolutely no road material and it is all imported from some commercial quarry, which makes road construction for this section of the county expensive.

North of Georgetown, during the past season where a section of road No. 1 led down a steep hill, the road was diverted and a cut and fill were made which eased the grade and made a great improvement on the existing conditions.

Maintenance work in the county is considerably on the increase. Instead of easing the traffic on the county roads, the Toronto-Hamilton Highway has increased it. Motorists from the north use the Halton County roads to get to the concrete highway. Much evidence of this is shown on the road known locally as the Guelph Line, which runs north from Burlington. On sections of this road the binder is completely gone and the stone road surface is becoming rough. Only by use of tar or asphaltic oils can this situation be relieved.

The constructed roads in Halton County on the whole are in very good condition, but some proper form of maintenance must be established in the near future or they will rapidly deteriorate. Stone should be crushed and left on the roadside in order that a patrol man would have material to work with.

WENTWORTH

The County of Wentworth was one of the first counties in the Province to establish a county road system. It has a completely constructed county road system of 140 miles, which is about 18 per cent. of the total road mileage of the county.

The work is under the supervision of a County Road Superintendent. There is a County Road Committee of three, with whom he consults as to the general policy, the character and amount of work to be done. Accounts are submitted to him, and after he certifies to them, they are passed by the Finance Committee and the council as a whole.

A distribution sheet is made out every two weeks, which after being signed by the Road Superintendent and Warden, the Treasurer issues a cheque for the amount of the sheet to the Superintendent, and he pays the accounts.

Men are paid every two weeks in Wentworth County. The Road Superintendent issues a cheque to each foreman for the amount of his time book, who pays the men and takes their signature in the time book.

There was very little road construction done this last season. Nearly all the designated roads have been built. Several small reinforced concrete bridges, however, have been constructed, the concrete being of a very high standard.

Maintenance work in Wentworth County has now become of importance. A section of the road leading from Hamilton to Niagara Falls passes through the county and with the Hamilton-Toronto concrete road east of Hamilton, traffic converges to connect with these main arteries.

Because of this increased traffic, it will be necessary to accumulate road repair material along the county roads, so that the patrolman, or repair men will have something to work with when a complete system of maintenance is established.

WELLAND

Welland County adopted a County Road System in 1912. It has a county road mileage of 160 miles which is about 15 per cent. of the total road mileage of the county.

The county road work is under the supervision of a County Road Superintendent and he consults with a Committee of three, appointed by the county council, who meet monthly, as to the general policy to be carried out during the season.

All accounts are submitted to the Road Superintendent who forwards them to a special Audit Committee (not the County Road Committee) whose sole duty is to check and pass county road accounts. The accounts are endorsed by all members of this Committee and a list forwarded to the County Clerk who makes out an order on the Treasurer and holds same until signed by the Warden. Orders on the Treasurer, signed by the Clerk and Warden, are sent to individuals or firms submitting accounts, who cash same at Treasurer's office, or at any bank in the county. The bank makes out pay envelopes from paylists furnished by the county, and the Road Superintendent takes the envelopes to the foreman who gives them to the men and takes their signature on the pay sheet.

The County Road Superintendent appoints foremen and endeavors to keep them employed during the whole season. During the seasons 1912-1916 inclusive, they built about 85 miles of crushed stone roads, but the drainage of them has not been properly taken care of. The county council decided at the January (1917) meeting of the county council not to construct any this season, but to simply maintain what was already built. At the June session they decided that some work was absolutely necessary and they started about the first of July on construction. Labour conditions at that season were very bad and on road No. 14 from lots 1-12 of Crowland Township, where imported stone was being used, car shortage interfered with the work so badly that it could not be finished this season. The coarse metal was all put on and dressed on top with local gravel, poor in quality, but it enabled the traffic to get on the stone and help to consolidate it.

On road No. 16, Con. V of Crowland about three-quarters of a mile was built of crushed stone from the county quarry. The stone was hauled by the

county truck, and the work here also was delayed owing to the numerous break-downs of the engine of the truck. Eventually the road was properly consolidated and the surface well finished. The ditching and grading was also very well done.

Maintenance work is not very systematically carried out. Some oiling and tarring is done, but when the roads were being built, no material was placed along them for maintenance and it is almost impossible to do any real repair work.

In order that the roads already built should not be worn out entirely, a systematic maintenance organization should be inaugurated and stone delivered on the different roads so the patrol men would have material handy. The drainage conditions should be carefully looked after, because it appears that the ruts which form in the newly built roads have lack of drainage largely as their cause.

MIDDLESEX

The County of Middlesex adopted a County Road System in 1906. Additions having been made to the system in subsequent by-laws, they have now about 408 miles of county roads which is approximately 18 per cent. of the total road mileage of the county.

The work is under the supervision of a County Road Superintendent who acts with the reeves and deputy reeves of all the townships with regard to the amount and location of the work to be carried on during the season. The Road Superintendent is authorized under a by-law to sign all accounts and pay sheets and his signature constitutes the Treasurer's authority for paying them. A time book is kept by the foreman and sent at intervals to the Superintendent who makes out the payroll. Men are paid by the foremen who receive a cheque from the Treasurer on the order of the Superintendent. Each foreman is bonded for \$500.00.

Roads in Middlesex County are practically all built of gravel which is found in abundance in all townships of the county except two. Up to the year 1917, gravel had been placed on the road in very deep layers as it could be cheaply obtained and the larger the amount that could be put on, the larger would be the Government grant. If it is not rolled—and to supply rollers to cover all the work done in the county during the season would be an expensive undertaking—this heavy coat of gravel makes it both inconvenient and dangerous to traffic. The policy has been changed during the past season. Where new work is to be done a half coat is put on in one season and the following season the second coat is applied. This gives better results and better satisfaction to all.

The Superintendent in Middlesex County has recently adopted a new plan for maintaining the roads. A large mileage of county roads has been heavily gravelled for years. They become rutted and full of shallow holes, although there is a good depth of metal. Where there is plenty of material on the road, the picks are put in the roller and the gravel surface is loosened for four inches in depth, graded evenly, wetted and rolled, and a smooth wearing surface is restored at small cost. If the shoulders become too high for the centre of the road, they are graded off and hauled away.

ESSEX COUNTY

Essex County adopted a County Road System of 142 miles in 1916. This is about 21 per cent. of the total road mileage in those townships of the county which are included in the system.

The work is under the supervision of a County Road Superintendent who consults with a Committee of five members of the county council. All paylists and accounts are submitted to the County Road Superintendent who signs them

and makes out a distribution sheet. The Treasurer then pays by cheque from the distribution sheet. If it is a paylist, a cheque covering the amount of the paylist is sent to the foreman who pays the men and takes their signature.

No road construction has been attempted since the adoption of the system, but several culverts and small span bridges have been built. In the building of the culverts the county furnishes all the material and the contractor furnishes the forms and builds the bridge. The county is then reasonably sure that clean gravel and the specified quantity of steel and cement will be put in the structure.

With the exception of the Talbot Road, practically all the roads in the County Road System have a clay surface. The Road Superintendent has inaugurated a patrol system for the dragging of these roads. Each man is given about four miles—they started with seven but have reduced it to four or five—and he must get out after each rain and make his rounds or his place goes to someone else. The result is very satisfactory, and during the late spring, summer and early autumn the roads are in excellent condition. Moreover, it has created a friendly rivalry between the patrolmen and they strive to outdo each other in getting results. The Township Councils having seen what systematic dragging would do for the county roads have improved their roads as well. The cost of maintaining the clay roads in this way costs the county approximately \$32.00 per mile per year.

When labour conditions become better and the cost of machinery is less, Essex County will no doubt commence to surface their roads with gravel or broken stone, but in the meantime the systematic dragging is giving excellent results.

OXFORD

A system of county roads was first established in the County of Oxford in 1904 when certain toll roads were purchased. The tolls were removed and the maintenance of these and other main roads provided for. The special Act under which this system was carried on having been found unsatisfactory, a new by-law was passed in 1907 when a system of 256 miles was assumed by the county. In 1913 under By-law No. 672, a reduced system of County Roads was designated consisting of approximately 214 miles, which is about 16 per cent. of the total road mileage of the county.

The work is under the supervision of a County Road Superintendent who consults with a Committee of the whole council at regular meetings of the council as to the general policy to be carried out. Accounts are submitted to the Road Superintendent who checks them and issues an order on the Treasurer for payment. The order on the Treasurer is sent to the individual to whom the accounts are to be paid, who countersigns it and returns it to the Treasurer. The Treasurer then issues a check for the amount of the order and retains the order for his receipt. In order to pay the men, the pay sheet compiled from the time book by the Road Superintendent is sent to a bank which makes out individual pay envelopes. The men call at the bank for the money and leave their signature on the time sheet.

The method of paying accounts is somewhat cumbersome and often leads the Treasurer into trouble at the end of the year. The person to whom an account is payable receives the order from the Road Superintendent to countersign. This he sometimes neglects to do until after the year is ended. The result is that the Treasurer's statement and that of the Road Superintendent do not correspond. If the warden and chairman of a Road Committee signed the accounts

and sent them on to the Treasurer, he could remit a cheque at once and there would then be no delay and trouble at the end of the year.

Roads in Oxford County are built of gravel, crushed gravel and crushed quarry stone, the latter being imported into sections of the county where there is no local material. They have a large mileage of metalled roads, but owing to the increased traffic during the last few years, the surface on many of them is becoming rough and rutted.

During the past season construction work was not as heavy as in former seasons. Several pieces of work that were not completed during 1916 were re-rolled this year. Two concrete culverts, one 8 ft. and one 12 ft. in span, that were washed out by heavy floods were rebuilt.

There is no systematic maintenance work carried on over the whole county, but a system of the nature of a patrol system was tried out on road No. 22 from Woodstock to Tavistock with excellent results.

There is a large condensed milk factory at Norwich and the heavy, narrow-tired milk waggon traffic leading into that town has rutted the roads badly. Crushed stone roads in this vicinity will not stand up under such traffic unless a careful system of maintenance is carried out.

All of which is respectfully submitted.

W. H. LOSEE,

Assistant Engineer.

APPENDIX D

PROVINCIAL HIGHWAYS

Report of Chief Engineer

TORONTO, April 6th, 1918.

W. A. McLEAN, Esq.,
Deputy Minister of Highways,
Ontario.

SIR,—In accordance with 7 Geo. V, c. 16, s. 12, subsec. 1, I have the honour to submit to you a report and certified statement covering work done and expenditure made in maintaining the Provincial Highway through the Townships of Pickering, Whitby, Whitby East, Darlington, Clarke and Hope. This description of work done and the summary of expenditure is for the period from the date when the highway was assumed on August 21st, 1917, up to January 3rd, 1918.

TOWNSHIP OF PICKERING

In the Township of Pickering an inspection of the highway and of the heavy traffic going over it, showed that a number of culverts required immediate renewal, while the road surface was such that a considerable stretch required gravelling, because of the roughness of the roadway. The entire length of road in the Township required grading in order to prevent water lying on the surface, and this work was commenced as soon as proper equipment could be purchased.

Grading

The road was graded from the east side of the Rouge Hill to the easterly limit of the Township, except at bridges, and in all a total length of approximately 8.6 miles. This work consisted in passing the grader along the shoulder of the road, and in that manner cutting off the shoulder and overcasting it to the side of the road, so that the centre of the road was left higher than the shoulder, thus securing proper drainage. The entire cost of this work was \$323.38.

Gravelling

The rough sections of the road were gravelled either lightly or heavily according to the requirements, and in all 3.1 miles were gravelled at a cost of \$2,933.64.

Bridges and Culverts

A number of timber culverts on the highway were in very poor condition, and when the road was taken over a culvert about one mile east of Pickering Village was found to have broken down causing a dangerous hole in the travelled part of the roadway. This culvert required immediate renewal and a foreman was at once put in charge to rebuild the structure in concrete. The size of the culvert is now three feet wide and four feet high, and the cost complete was \$624.72.

A second culvert about one-half mile east of Pickering Village was also in poor condition and was renewed in concrete. The opening provided is two feet wide and two feet high, and the culvert cost complete \$376.27.

A third timber culvert about three-quarters of a mile west of Dunbarton was also found to be unsafe, and was renewed in concrete at a cost of \$632.94. The opening of this culvert is now five feet wide and four feet high.

Petticoat Creek Bridge has a timber floor supported by timber stringers, and a number of these stringers were found to be decayed and dangerous to travel. New stringers were put in wherever required, and new planks were placed in the flooring wherever necessary.

Several other timber culverts with decayed stringers and flooring were made safe for heavy traffic at a cost of \$491.26, and this amount includes a quantity of timber purchased to renew decayed stringers and flooring in Pickering Village bridge. This amount is charged to maintenance.

Five corrugated ingot iron culverts were placed in the side ditches of the road at various points under farm entrances, and one concrete pipe culvert under the road proper was extended in order to make the highway safe for travel. The cost of these pipe culverts was \$174.42.

The total cost of new work on the construction of bridges and culverts amounted to \$2,012.15.

Earthwork and Ditching

At three points along the road considerable ditching was required due to the fact that the road was narrow, and being in a cutting tended to become boggy or rough after wet weather.

The first grading undertaken consisted in opening up the side road ditch on the south side of the road east of the Rouge bridge. This ditch was dug to a depth of about two and one-half feet below the crown of the road, and immediate benefit to the drainage of the road was observed.

The next work of ditching undertaken consisted in widening out and grading the road through the Village of Dunbarton. This road had been rendered very rough due to all surface water following down the centre of the highway. Ditches were constructed on the north and south sides of the hill and proper provision was made for conveying all water to a good outlet.

Work was also completed on the hill in front of the church on Lot 5, where wet weather frequently caused impassable conditions. The roadway on this hill was widened out, proper ditches constructed and the water drained away. The total cost of all the ditching, grading and earthwork on the road was \$2,540.78.

It was contemplated to construct catch basins on the Rouge Hill in order to divert the heavy flow of water. Cast iron gully gratings were purchased for this work and will be installed where necessary. The cost of these gratings was \$25.58.

Snow Removal

During the winter snow drifts tended to form on different parts of the road and these drifts were of such a size as to seriously delay or completely block the traffic. The road was kept open for public travel at a cost of \$67.00, which amount covers snow shovelling over the entire length of the road within the Township.

Summary

All charges included in the following totals for work done in the Township of Pickering cover only pay sheets for men and teams, and accounts for material used in maintenance and construction of the road, for the stated period.

Construction

	Total Expenditure.	Cost to Township.	
Earthwork	\$2,540 78	\$762 23	
Bridges and Culverts:—			
Station 5952-13	624 72	187 42	
Station 5987-36	376 27	112 88	
Station 6221-80	632 94	189 88	
Corrugated Ingot Iron and Concrete Pipe	174 42	52 33	
Miscellaneous	203 80	61 14	
Gully Gratings	25 58	7 67	
	<u>\$4,578 51</u>	<u>\$1,373 55</u>	<u>\$1,373 55</u>



SHARP TURN IN THE PROVINCIAL HIGHWAY.

At Welcome, near Port Hope, obstructed by telephone poles and letter boxes.

Maintenance

	Total Expenditure.	Cost to Township.	
Gravelling	\$2,933 64	\$880 09	
Grading Shoulders	323 38	97 01	
Strengthening Bridges and Culverts ...	491 26	147 39	
Snow Removal	67 00	20 10	
	<u>\$3,815 28</u>	<u>\$1,144 59</u>	<u>\$1,144 59</u>
Total Cost of Work to Township			<u>\$2,518 14</u>

TOWNSHIP OF WHITBY

An examination of the Provincial Highway in this Township showed that the road was flat, and urgently required grading in order that water would properly drain from the surface. In two places the road was found to be very rough, due to the absence of side ditches, and steps were immediately taken to repair these sections.

Grading

The work of grading consisted in passing the grader over the shoulder of the road and throwing a portion of the earth towards the ditches so that the centre of the road was left higher to give drainage. This work was carried out from the westerly to the easterly boundary of the Township, except in the Town of Whitby. The entire distance graded was two miles, and this work cost \$99.00.

Gravelling

Gravel was applied to the road in two short stretches, making in all about one-quarter mile in length. One stretch of gravel was applied a short distance west of



DANGEROUS CONDITIONS REMOVED.

Turn at Welcome, after widening, and removal of poles and letter boxes.

the Town of Whitby, while the larger amount was placed on the road at the hill about one-half mile east of the Town of Whitby. The work of gravelling cost in all \$223.84.

Bridges and Culverts

A charge of \$3.00 is made to cover the cost of timber placed in a culvert a short distance east of Whitby.

Summary

All charges included in the following totals for work done in the Township of Whitby cover only pay sheets for men and teams and accounts for material used in the maintenance of the road, for the stated period.

Maintenance

	Total Expenditure.	Total Cost to Township.	
Grading	\$99 00	\$29 70	
Gravelling	223 84	67 15	
Bridges and Culverts	3 00	0 90	
	<hr/>	<hr/>	
	\$325 84	\$97 75	
Total Cost to Township			\$97 75

TOWNSHIP OF WHITBY EAST

The examination of the road indicated that for some distance east and west of Oshawa considerable gravelling would be required in order to improve the stretches of very rough road.

A culvert located about one mile west of Oshawa was also found to be in dangerous condition and urgently required renewal. The road was also flat and required grading in order to give proper drainage facilities to the travelled portion.

Grading

The road was graded from the easterly to the westerly limits of the Township, except within the limits of the Town of Oshawa, and the work carried out consisted in passing the grader along the shoulder of the road. In this manner the material was overcast to the side of the road, thus leaving the centre higher and providing drainage. The length of the road graded was 2.8 miles, and the cost of this work was \$78.89.

Gravelling

Heavy gravelling was required westerly from the Town of Oshawa for a distance of about one mile, and another section about one-quarter of a mile in length was completed at the westerly side of the Township. East of Oshawa the road was gravelled in some sections heavily and in other sections lightly, according to the condition in which the old surface was found to be. In all 1.7 miles of road were heavily or lightly gravelled, and the entire cost of this work was \$2,566.20.

Bridges and Culverts

The culvert about one mile west of Oshawa was made safe for public travel by placing temporary stringers at a cost of \$12.00. This timber was used to render the culvert secure until such time as the structure could be rebuilt, as the sidewalls and stringers in the old culvert were in such condition that complete renewal was imperative. The work of constructing a reinforced concrete culvert at this location was commenced early in December, and a culvert ten feet wide and four feet six inches in height of opening was constructed. The accounts received for this work up until January 31st, 1918, totalled \$1,456.61.

Summary

All charges included in the following totals for work done in the Township of Whitby East, cover only paysheets for men and teams and accounts for material used in maintenance and construction of the road for the stated period.

Construction

	Total Expenditure.	Cost to Township.	
Bridges and Culverts	\$1,456 61	\$435 98	\$435 98

Maintenance

	Total Expenditure.	Cost to Township.	
Grading	\$78 89	\$23 67	
Gravelling	2,566 20	769 86	
Bridges and Culverts	12 00	3 60	
	<u>\$2,657 09</u>	<u>\$797 13</u>	797 13
Total Cost to Township			<u>\$1,234 11</u>

TOWNSHIP OF DARLINGTON

In Darlington Township practically the entire length of the highway was flat and proper grading was urgently required. In several places adequate side ditches were necessary to drain the roadway.

Grading

The road was graded from the easterly to the westerly limits of the Township, in all a distance of 7.6 miles at a cost of \$249.29. This work consisted in passing the grader along the shoulder of the road, and cutting off and overcasting the earth so as to make the centre of the road higher than the shoulders. In this manner proper drainage was secured.

Gravelling

The rough sections of the road were gravelled either lightly or heavily according to the necessary requirements of travel. In all 5.8 miles of the highway were gravelled or patched, at a total cost of \$2,977.95.

Earthwork

An inspection of the road at the mill on Lot 33 showed that considerable ditching and widening out of the road surface was necessary, in order that proper drainage could be secured and the surface water prevented from running down the centre of the road. The road was widened out, proper ditches were constructed, and the material was used for obtaining a greater width of roadway over the embankment at the foot of the hill. The cost of this earthwork was \$637.95.

Bridges and Culverts

To provide drainage for the north side road ditch at the improvement carried out on Lot 33, a galvanized pipe eighteen inches in diameter was installed under the side road leading from the Provincial Highway.

On Lots 23 and 24 corrugated pipe culverts were somewhat short, and there was danger of vehicles running over the end of the pipe. Each of these culverts was extended a distance of six to seven feet on the upstream and downstream ends, and the road was widened to prevent accidents. The total cost of all bridges and culverts in this Township was \$251.71.

Summary

All charges included in the following totals for work done in the Township of Darlington cover only paysheets for men and teams, and accounts for material used in maintenance and construction of the road, for the stated period.

Construction

	Total Expenditure.	Cost to Township.	
Earthwork	\$637 95	\$191 39	
Bridges and Culverts	251 71	75 51	
		<u>\$266 90</u>	\$266 90

Maintenance

	Total Expenditure.	Cost to Township.	
Grading	\$349 29	\$74 79	
Gravelling	2,977 95	893 38	
		<hr/>	
		\$968 17	\$968 17
			<hr/>
Total cost to Township			\$1,235 07

TOWNSHIP OF CLARKE

Grading of the surface of the roadway to provide satisfactory drainage and a heavy coating of gravel over the greater length of the highway was found necessary in Clarke Township.

Gravelling

From the easterly limit of the Township westerly to the easterly limit of Newcastle, gravel was applied to the surface of the road either lightly or heavily according to the condition the surface of the road was in. In all three miles of gravelling was completed at a cost of \$1,690.55.

Grading

The grader was used to cut the shoulders of the road and turn the material outward toward the ditch in order to provide better drainage for the central portion of the road. This work was carried on from the westerly limit of the Township to within two miles of the easterly boundary of the Township, in all a distance of 5.6 miles at a cost of \$232.00. No grading was done within the limits of the Village of Newcastle.

Bridges and Culverts

Two concrete pipe culverts, eighteen inches in inside diameter, were placed under the roadway. One is located about one mile east of Clarke Post Office and the other is located about two miles east of Newcastle. One concrete pipe, eighteen inches in inside diameter, was placed across the road in order to drain the north side ditch of the road at the swamp about two miles east of Newcastle. One twelve-inch concrete pipe was placed under a farm entrance one-half mile east of Clarke Post Office. The total cost of this work amounted to \$94.70.

Earthwork and Grading

A short distance east of Clarke Post Office the existing north ditch of the road required deepening in order to intercept the flow of water going from higher land at times of spring thaws. This ditch was deepened and the roadway widened out to the proper width at a cost of \$82.35.

Guard Rails

Guard rails were placed wherever required at pipe culverts, and also on the north side of the road about one and one-half miles east of Clarke Post Office. The cost of the guard rail was \$6.70.

Snow Removal

During the winter months it was found that the road tended to block with snow a short distance east of the west townline of the Township, and also at a point about two miles east of Clarke Post Office. These drifts were kept open for public travel, and snow blockades were removed at a cost of \$22.50.

Summary

All charges included in the following totals for work done in the Township of Clarke, cover only paysheets for men and teams and accounts for material used in the maintenance and construction of the road for the stated period.

Construction

	Total Expenditure	Total Cost to Township.	
Earthwork	\$82 35	\$24 70	
Bridges and Culverts	94 70	28 41	
		<hr/>	
		\$53 11	\$53 11

Maintenance

	Total Expenditure	Total Cost to Township.	
Grading	\$232 00	\$69 60	
Gravelling	1,690 55	507 17	
Guard Rails	6 70	2 01	
Snow Removal	22 50	6 75	
		<hr/>	
		\$585 53	\$585 53
		<hr/>	
Total Cost to Township			\$638 64

TOWNSHIP OF HOPE

On inspecting the highway within the Township it was found that the road required gravelling, and that a number of culverts were necessary both under the road and also under farm entrances and side roads. The road surface was flat and the shoulders required cutting off, in order that proper drainage for the centre travelled portion of the highway could be secured. This work was commenced as soon as men could be hired and equipment arranged for.

Grading

Grading was carried on from the westerly limit of the Town of Port Hope through Welcome, and continuing westerly in all for a distance of seven and one-half miles. This work consisted in passing the grader along the road and cutting off the shoulder so that the material was thrown away from the centre of the road towards the ditch. In this manner a considerable improvement in the drainage of the surface of the road was observed, and the seven and one-half miles of grading of this character was completed at a cost of \$443.00.

Gravelling

A considerable portion of this road was fairly rough and some sections of it required a heavy coat of gravel in order to construct a fair surface for public travel. From Port Hope west for a distance of three and one-quarter miles the road was heavily gravelled and rolled, so that a fair surface was at once obtained. Westerly from the point where heavy gravelling stopped the road was not in as bad condition, and a light coat of gravel was applied for a distance of four and three-quarter miles. The entire cost of gravelling the eight miles of road within Hope Township was \$2,464.11.

Bridges and Culverts

At station 4163-15 an old timber culvert was found to be in an advanced state of decay and liable at any time to become dangerous to travel. The roadway at this point was also very narrow and complaints were received from local people as

to these two points. It was, therefore, decided to build a new concrete culvert a short distance west of the existing timber structure, and to fill in and widen the roadway at the present opening. An examination of the drainage area of this creek north of the Provincial Highway, and also an inspection of the culverts on the creek where it crosses the sideroad south of the Provincial Highway, and also the Canadian Pacific Railway and Grand Trunk Railway culverts, showed that a larger culvert than the existing timber structure was required. An opening twelve feet wide and eight feet six inches high was provided, and this concrete culvert cost, complete, \$2,421.88.

A galvanized pipe culvert eighteen inches in inside diameter was placed across the road on Lot 35, while at Welcome the improved drainage provided consisted in an eighteen-inch concrete pipe directly across the centre of the road. A nine-inch tile drain was also placed in the side ditch to provide drainage under the entrance to the parsonage. A short distance east of Welcome an eighteen-inch concrete tile was placed across the road, while about one mile west of Port Hope a fifteen-inch tile was put in position at the road intersection to provide side-ditch drainage. The cost of the above tile complete in place was \$535.16.

A charge for maintenance of bridges and culverts totalling \$5.76 is also made, and covers the cost of timber which was purchased and used as stringers in a short bridge about one-quarter mile east of Welcome.

Earthwork and Grading

When the road was first taken over it was found that the abrupt turn at the corner at Welcome was a source of danger to people unacquainted with the road, and on account of the obstructed vision at this corner it was decided to widen it out in order to prevent accidents. A small piece of property was, therefore, secured and considerable grading work done to widen out the roadway at this point. Other obstructions consisting of rural mail delivery boxes, telephone poles and guard rails were also removed from the travelled portion of the road and placed where they could not be a menace to travel. Considerable widening of the roadway was also carried out at the new concrete culvert, and the entire cost of earthwork at the Welcome corner and this culvert was \$911.59.

Guard Rails

At a number of the culverts guard rails were placed to protect the public, and this work was completed at a cost of \$33.00.

Snow Removal

During the month of January, 1918, it was found that snow drifts tended to form on the highway at different points, and instructions were given to have the road kept open for traffic. This was done at a cost of \$6.50.

Summary

All charges shown below cover work done in the Township of Hope, and the amounts indicated were paid out for material and paysheets for men and teams for maintenance and construction of the road, from August 21st, 1917, to January 31st, 1918.

Construction

	Total Expenditure.	Cost to Township.	
Earthwork	\$911 59	\$273 48	
Bridges and Culverts:—			
4163-15	2,421 88	726 56	
Pipe Culverts	535 16	160 55	
Guard Rails	33 00	9 90	
	<u>\$3,901 63</u>	<u>\$1,170 49</u>	\$1,170 49

Maintenance

	Total Expenditure.	Cost to Township.	
Gravelling	\$2,906 11	\$871 83	
Bridges and Culverts	5 76	1 73	
Snow Removal	6 50	1 95	
	<u>\$2,918 37</u>	<u>\$875 51</u>	\$875 51
Total Cost to Township			<u>\$2,046 00</u>

Yours truly,

GEO. HOGARTH,

Chief Engineer.



AN OLD GRAVEL ROAD IN MIDDLESEX COUNTY.
After Scarifying, Reshaping and Rolling.

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ANNUAL REPORT

OF THE

Department of Public Highways

ONTARIO

1918

PRINTED BY ORDER OF
THE LEGISLATIVE ASSEMBLY OF ONTARIO



TORONTO:

Printed by A. T. Wilgress, Printer to the King's Most Excellent Majesty
1919



OLD DUNGANNON BRIDGE IN ASHFIELD TOWNSHIP.
This bridge was replaced by the concrete structure shown below.



NEW DUNGANNON BRIDGE IN ASHFIELD TOWNSHIP.
A concrete bridge on the Huron County Road System.

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To His Honour SIR JOHN STRATHEARN HENDRIE, K.C.M.G., C.V.O., a Colonel in the Militia of Canada, etc., etc.

Lieutenant-Governor of the Province of Ontario.

MAY IT PLEASE YOUR HONOUR:

I herewith beg to present for your consideration the annual report of the Department of Public Highways, relating to Highway Improvement in the Province of Ontario.

Respectfully submitted,

F. G. MACDIARMID.

Minister of Public Works and Highways.

*To the Honourable F. G. MACDIARMID,
Minister of Public Works and Highways.*

SIR,—I have the honour to submit the annual report of the Department of Public Highways, having special reference to the work carried on by the several counties of Ontario under the Act to Aid in the Improvement of Public Highways, and subsidized by the Province; and to the work carried on by this Department under the Act to Provide for a Provincial Highway System.

Appended hereto are reports and statistics with respect to other activities and duties of the Department of Public Highways for the year 1918, including the Motor Vehicles Act and provisions of the Municipal Act with respect to Highway Bridges; a report of the annual meeting of the Ontario Good Roads Association held in March, 1919; and also a report of the annual meeting of the Eastern Ontario Good Roads Association.

I have the honour to be,

Sir,

Your obedient servant,

W. A. McLEAN.

Deputy Minister of Highways.

Parliament Buildings, Toronto,
April 11th, 1919.



ON THE PROVINCIAL HIGHWAY.
Graded, ditched and gravelled.

ANNUAL REPORT OF THE Department of Public Highways

W. A. McLEAN, Deputy Minister

Road improvement throughout the Province promises to benefit, in a large and encouraging degree, with the cessation of the war, and the return of peace.

War conditions were increasingly evident throughout 1918 with respect to road construction and maintenance, and were more especially apparent in regard to the scarcity and high price of common labour, the cost of materials, equipment, freight, and all items of road expenditure. Scarcity of farm labour rendered it necessary to limit road work as far as possible during harvest, and at periods of the year when farm operations were most pressing.

With the expectation of readjustment in regard to these difficulties, and a return to a more normal and settled situation, the organization for road betterment which has been effected while the war was in progress should undoubtedly enable general and more substantial work to be carried out in all parts of the Province, with a view to steadily extending the advantages of good roads to every community and to every citizen.

I.

EXPENDITURE BY TOWNSHIP COUNCILS

The influence of the war on township roads is strikingly apparent from the returns of expenditure by township councils for the years 1913 to 1918 inclusive as follows:—

1913—	Total of township council expenditures.....	\$2,761,702
1914—	“ “ “ “	2,615,137
1915—	“ “ “ “	1,680,187
1916—	“ “ “ “	1,730,689
1917—	“ “ “ “	1,615,790
1918—	“ “ “ “	1,768,785

Classification of this expenditure will be found in Appendix A, page 19 of this Report.

Betterment of township road conditions can be confidently expected from the following influences:—

1. An increased expenditure by township councils may be anticipated with the return of peace conditions—an increase to at least the amounts immediately prior to the war.

2. The growth of county road systems will relieve township councils from the task of financing the more heavily travelled roads.

3. The construction of county and Provincial highways will serve as a model for an improved class of township work.

4. The tendency to improve township organization by placing township work under the supervision of a permanent township road overseer.



A GRAVEL ROAD IN WELLINGTON COUNTY.

Kept in good condition by systematic use of a log drag.

II.

COUNTY ROADS

Good municipal government in Ontario has received an impetus by the development of County Road Systems, subsidized by the Province. This has necessarily been beneficial by adding an important public duty to the responsibility of the County Council.

County roads are not a new departure in Ontario. The value of this organization was proven by the earlier road-builders of the Province. Middlesex, Wellington, Hastings and others owe the basis of existing main roads to that system. The Highway Improvement Act of 1901 revived interest in county roads, by appropriating \$1,000,000 to be given in aid of model county roads.

The Act of 1901 granted aid to county roads in the proportion of one-third of expenditure on construction.

In 1907 the county road grant was established on a permanent basis, and by subsequent legislation,

- (1) The grant for construction was increased to 40 per cent.
- (2) A grant of 40 per cent. was provided for maintenance.
- (3) A grant of 60 per cent. was provided for "Provincial County Roads."
- (4) Cities are required to contribute to "Suburban Roads."

Provincial County Roads

Provincial county roads are roads which, because of their length and location, carry a considerable amount of through traffic, making them cost proportionately more to construct and maintain, and which additional cost the district through which they pass should not be required to pay. The larger subsidy of 60 per cent. is granted to more fairly equalize the burden.

With grants of 40 per cent. for the less-travelled roads, and 60 per cent. for the most heavily-travelled roads, it is estimated that the cost of county roads will now be about equally divided between the counties and the Province.

All the counties in the Province are now operating under this system, and 9,500 miles have been designated for improvement, and to which the Provincial grant is assured.



WIDENING A GRADE ON THE PROVINCIAL HIGHWAY.

Formerly a long, narrow embankment on which two vehicles could not pass.

Responsibility and Supervision

Responsibility for the condition of county roads rests upon the county councils, who make their own appropriations, and carry out the work under their own superintendent. The Province subsidizes their work.

County roads are primarily the market roads of the townships, radiating from the cities, towns, villages and shipping points. They are the roads which have in the past absorbed the greater part of township expenditure, because of the heavy traffic on them. Every citizen benefits by them.

The relief given to township councils by placing the most heavily travelled market roads under the County Road System is a direct form of aid to all the township roads.

Classification of Suburban Roads

In addition, heavily travelled roads radiating from cities are being placed in a class of "Suburban Roads," to which cities contribute equally with the county: and the Provincial subsidy is 40 per cent. or 60 per cent. of the total, according to the class of road.

General Policy Pursued

It has been the policy of the Ontario Highway Department to encourage vigorously county road systems and to place no unnecessary restriction on the extension of these systems so as to include all systematic work which might be entitled to aid. The prosecution and extension of county road systems to a reasonable extent will provide that expenditure be made under experienced supervision, with proper machinery, and that the work, when completed, will be reasonably maintained. County Councils are everywhere learning to take this view of the situation and are seeking to bring their county road systems under systematic schemes of construction and maintenance.

Returns of county road work in 1918 show a total expenditure of \$2,226,899.68, of which \$1,482,610.30 was for construction, and \$744,289.38 for maintenance. The Provincial subsidies amounted to \$815,439.99, of which \$604,245.01 was for construction and \$211,194.98 for maintenance. The work included the following:—

Miles of road metalled with broken stone	98.01
Miles of road metalled with gravel	116.47
<hr/>	
Total mileage of surfaced road, 1918.....	215.48
Miles of road graded only	321
Number of bridges constructed	93
Number of Culverts	900

Details of county road expenditures are shown in the schedules forming Appendices B and C of this report, and of county road organization and inspection, in Appendix E.

III.

PROVINCIAL HIGHWAYS

The Provincial Highway System was authorized by an Act of 1917, and provides that the Department of Public Highways may take over, maintain and construct leading roads throughout the Province.

Classification of roads and responsibility according to traffic has been one of the chief factors of success in every country which has developed a general system of good roads. While township councils were responsible for all the roads within their boundaries, and before there was a proper distribution of responsibility, very little real progress was made in road improvement in Ontario.

A step in advance was made, and better roads resulted, when roads were divided into two classes, and county councils were made responsible for roads carrying the heaviest market traffic. For a similar reason, Provincial Highways are a logical development in the road system.

Traffic and Provincial Highways

Many miles of road in the Province do not carry more than five or ten vehicles daily. Many do not carry more than two or three vehicles. Few purely township roads carry more than twenty vehicles daily. Apart from culverts and bridges, such roads, particularly in a district where gravel is plentiful, can readily be maintained by statute labour, or its equivalent.

Where traffic approaches forty or fifty vehicles daily, and mounts from that to the hundreds, necessary road expenditures show proportionate increases. By far the greater portion of township expenditure was formerly absorbed by the roads now included in County Road Systems. County Road Systems, as now laid out, when completed will carry fully eighty per cent. of the traffic of the Province. Relieved from this large amount of traffic, township councils are able to devote their efforts to the roads of light traffic, which can be cheaply built and maintained.

The majority of county roads now carry from fifty to one hundred vehicles daily, summer traffic. This is not a maximum for any day of the year, but is an average of a census extending over a week. Some roads average two hundred vehicles—roads radiating from the more active market towns and cities.

A census of traffic on the Toronto-Hamilton Highway in June, 1918, showed a daily average of 2,423 vehicles passing Long Branch; 1,745 vehicles passing Port Credit; and 1,697 vehicles at a point west of Burlington.

On the Provincial Highway, by a census in 1918, between Hamilton and St. Catharines, no point showed a traffic of less than 600 vehicles daily, and near Beamsville the number was 1,571.



ON THE PROVINCIAL HIGHWAY.

Bridges reconstructed, hill cut and ditched, the embankment across a river-flat raised and widened, the surface gravelled.

In Pickering Township, traffic amounted to an average of 579 vehicles on the Provincial Highway; near Kingston, 339; near Brockville, 414.

Between Woodstock and Ingersoll the traffic census in 1914 showed an average of 259 vehicles; near Brantford, 388 vehicles; at Ancaster, 237 vehicles. Traffic along this route has since been steadily increasing.

The main line of the Provincial Highway System from Windsor to the Quebec Boundary, with branches to Niagara and Ottawa, constitutes a series of important market roads, to which is added the traffic from numerous towns, cities and shipping points linked together along the route.

The future potential traffic of the route is very great. Within twelve miles of the route is fifty-two per cent. of the total population of the Province, and over one-third of the rural population.

It passes through twelve out of a total of twenty-three cities in the Province, containing eighty-four per cent. of the city population.

It passes through cities, towns and villages having seventy per cent. of the total urban population of the Province; and through twenty counties out of thirty-six counties in the Province.

The Provincial Highway passes through counties possessing 54 per cent., viz., \$843,955,479, of the total farm property (including land, buildings, implements and stock); and producing 51 per cent., viz., \$170,576,414, of the total field crops of the Province of Ontario, for 1917.

The Provincial Highway a Series of Market Roads

The chief road contemplated in the Provincial System was opened as a through route by the early settlers, who established their homesteads along or as near to it as possible. Towns and cities grew up along it. The farming community along the route is fairly entitled to a good market road. Yet, as soon as the various sections



A WINDING SECTION OF THE PROVINCIAL HIGHWAY.

This portion has not yet been graded and ditched to the final cross-section, but is kept in repair by gravelling and dragging.

are joined up, or approximately so, with ordinary construction for local purposes, heavy commercial traffic will render the expenditure futile. Lincoln County Council had been spending nearly \$1,000 per mile annually, in an effort to maintain the Queenston and Grimsby Stone Road, twenty-six miles in length, through that county. The cost merely of repairing this road would build many lightly travelled roads in the Province.

Section by section it forms a series of most important market roads for local farm traffic. Residents on and adjacent to these roads are entitled to its proper maintenance for their market traffic. These roads must be so built as to carry all the heavy traffic which is flowing over them (or which will flow over them when improved to a reasonable standard), or else the farming community along them is unfairly penalized for residing on them. Local residents either cannot maintain the road, or do so only at an unfair cost.

Expenditure Already Exists

Because they are assumed as Provincial Highways, new roads are not created; the roads already exist, the bridges and culverts on them must be built, and through township and county organization, considerable expenditures are being made on them, as indicated by experience as stated on the Queenston and Grimsby Road. But the results are disappointing in many cases, for those portions of the proposed Provincial Highway, under local management, are not being built and maintained in proportion to the traffic over them, and many of the townships through which they pass have protested their inability to properly maintain them, urging, and even demanding as their right, that the Province assume the cost of the major portion of this traffic.

Equitable Local Apportionment of Cost

In conjunction with county road grants, the Provincial Highway will afford a well-balanced system, whereby market roads suited to traffic can be built in all parts



A WIDENED AND GRAVELLED PORTION OF THE PROVINCIAL HIGHWAY.

of the Province, at approximately the same cost locally to each district. It is the aim of the Provincial Highways Act to require each benefited municipality to pay toward a Provincial Highway an amount at least equal to the cost of a road suited to local market traffic. This is equitable for all, for a good gravel or stone road, lightly travelled, is fully as useful in its place as is the more expensive road built for the heavier traffic which the latter must carry.

If we are not to build these roads strong enough for the combined traffic they are to carry, the farmers so unfortunate as to reside along or who depend upon sections of these main routes for access to market will be penalized, for they can have the needed market road by no other effective means.

The commercial and social advantage cannot be doubted of joining up intimately the community life of such towns and cities as Ottawa, Cornwall, Prescott and Brockville; Cobourg and Port Hope; Oshawa and Whitby; and linking these at last with Toronto. Or in the west, bringing together Hamilton, St. Catharines and Niagara Falls; giving Hamilton and Brantford easy access the one to the other and to Toronto; and facilitating the closer relations of Woodstock, Ingersoll and London; St. Thomas, Chatham and Windsor.

IV.

MOTOR VEHICLE REGISTRATION

The use of motor cars in the Province has continued to increase. In 1918 there was registered one vehicle for each 23 of population. In comparison with the use of cars in other Provinces and in the United States, there would appear to be room for at least 225,000 cars in Ontario (or one for each 12 of population); which number will probably be reached by a substantial growth annually.

The motor vehicle has become a recognized necessity of every-day life; as much so as the telephone, telegraph, steam railway, and similar advantages of the age in which we live. It enters into the practical affairs of the farmer, merchant, doctor, business men, men of the skilled trades, manufacturers, and has given the common highway a greatly increased transportation value.

The road and the vehicle are complementary parts of the one machine. The commercial value of well-built roads connecting urban centres is equal to the efficiency of the motor car—and the efficiency and usefulness of the motor car and motor truck have been demonstrated beyond all question by the large and growing number employed.

In 1918, there were 101,845 motor cars and 7,529 motor trucks registered in the Province. Motor trucks are purely commercial. Of the passenger cars 37,262 were owned by farmers. Of the passenger cars, 84,018, or over 82 per cent., were small machines such as the Ford or Chevrolet, of 25 horse-power or less.

Increase of Registration over 1917

Passenger car registration, 1918	101,845	
Motor truck registration, 1918	7,529	
		<hr/>
Total registration, 1918		109,374
Passenger car registration, 1917	78,861	
Motor truck registration, 1917	4,929	
		<hr/>
Total registration, 1917		83,790
		<hr/>
Total increase in registration, 1918		25,584

Municipal Distribution of Ownership

Passenger cars owned in Toronto	17,171	
Passenger cars owned in other cities	19,528	
		<hr/>
Total passenger cars owned in cities		36,699
Passenger cars owned in towns, villages and townships		64,900
		<hr/>
Total cars owned in Ontario		101,599
Total cars owned outside Ontario		246
		<hr/>
Total registration		101,845

Classification of Car Types

Touring cars	91,866	
Runabouts	7,114	
Coupes, sedans and limousines	2,758	
Taxicabs	49	
Buses and ambulances	58	
<hr/>		
Total registration		101,845

Occupation of Owners

Farmers and drovers	37,758	
Skilled trades	6,634	
Business firms	2,106	
Merchants and manufacturers	27,144	
Physicians	2,712	
Other professions	3,529	
Commercial travellers	2,507	
Agents	2,833	
Liverymen	1,784	
Soldiers	634	
Government and corporations	569	
Military departments and units	365	
Unspecified and unoccupied	13,270	
<hr/>		
Total		101,845

Classification According to Horse Power

Steam cars	4	
Electric cars	162	
25 h.p. and less	84,018	
26 h.p. to 30 h.p.	13,220	
31 h.p. to 35 h.p.	2,581	
36 h.p. to 50 h.p.	1,829	
51 h.p. and over	31	
<hr/>		
Total		101,845

Weight of Commercial Vehicles

$\frac{1}{2}$ -ton trucks	2,567	
1-ton trucks	3,274	
$1\frac{1}{2}$ -ton and 2-ton trucks	830	
$2\frac{1}{2}$ -ton trucks	23	
3-ton and $3\frac{1}{2}$ -ton trucks	284	
4-ton and $5\frac{1}{2}$ -ton trucks	533	
6-ton and over	18	
<hr/>		
Total		7,529

Motorcycles

Motorcycles registered, 1917	5,180
Motorcycles registered, 1918	5,002

Total decrease in 1918 178

Chauffeurs' Licenses

Licensed drivers registered in 1917	8,214
Licensed drivers registered in 1918	10,629
Total increase in 1918	2,415

Licenses Issued for Motor Vehicles, 1903 to 1918

Year	Passenger Cars	Commercial Cars	Motor Cycles	Professional Drivers	Revenue
					\$
1903	220				1,680 00
1904	535				1,142 00
1905	553				5,523 15
1906	1,176				8,098 50
1907	1,530				10,007 75
1908	1,754				12,418 75
1909	2,452				24,394 01
1910	4,230				50,831 22
1911	11,339				73,255 96
1912	16,266		1,754	2,965	105,558 95
1913	23,700		2,900	3,514	149,210 45
1914	31,724		3,633	3,773	334,759 78
1915	42,346		4,174	5,322	639,987 09
1916	51,589	2,786	4,287	5,966	930,753 00
1917	78,861	4,929	5,180	8,214	1,214,693 87
1918	101,845	7,529	5,002	10,629	

APPENDIX A

Township Road Expenditure

The following schedule shows the expenditure by the Township Councils of the Province, grouped according to counties, for the period of six years, 1913-1918, inclusive. This does not include the expenditure by councils of counties, towns, villages and cities; nor Provincial grants or expenditures.

Name of County	1913	1914	1915	1916	1917	1918	Total
Algoma	\$26,223	\$27,347	\$20,974	\$21,345	\$20,971	\$24,456	\$141,316
Brant	54,417	84,597	37,149	48,613	41,934	21,498	288,208
Bruce	89,168	71,706	48,403	50,944	64,104	66,814	391,139
Carleton	66,935	72,838	40,955	41,423	40,320	31,824	294,295
Dufferin	59,816	31,574	23,253	27,093	15,301	17,462	174,499
Elgin	83,206	78,799	65,901	67,808	49,836	47,730	393,280
Essex	116,394	103,005	84,675	43,095	42,749	66,297	456,215
Frontenac	40,941	40,819	29,147	24,480	29,189	27,757	192,333
Grey	96,579	75,207	47,899	75,506	58,159	69,661	423,011
Haldimand	22,291	25,687	20,287	16,995	22,048	24,290	131,598
Haliburton	9,896	13,656	6,382	6,889	11,586	10,606	59,015
Halton	40,295	46,895	25,601	26,075	20,299	24,768	183,933
Hastings	33,444	34,134	26,158	29,791	24,197	23,518	171,242
Huron	114,985	71,096	50,303	63,994	45,508	60,690	406,576
Kenora	2,120	2,710	2,547	2,622	2,557	2,372	14,928
Kent	57,092	65,412	43,779	48,579	42,006	38,456	295,324
Lambton	112,438	124,576	57,471	72,393	56,026	48,136	471,040
Lanark	18,623	18,168	15,546	13,143	11,347	10,636	87,463
Leeds and Grenville	72,677	91,475	60,299	59,065	48,306	70,686	402,508
Lennox and Addington	21,615	19,772	13,874	12,871	15,370	16,914	100,416
Lincoln	49,042	37,120	34,072	37,195	35,589	56,307	249,325
Manitoulin	10,446	12,186	7,941	7,909	8,935	9,488	56,905
Middlesex	120,865	114,507	98,449	94,608	64,349	74,612	567,390
Muskoka	19,641	21,311	19,794	17,863	18,896	19,847	117,352
Nipissing	85,889	54,862	18,698	25,956	41,455	8,749	235,609
Norfolk	44,181	39,699	20,664	20,730	18,983	28,545	172,802
Northumberland and Durham ..	84,597	56,526	58,086	56,422	53,564	39,083	348,278
Ontario	76,408	54,347	48,580	51,011	48,978	56,551	335,875
Oxford	78,156	66,398	44,081	51,776	40,488	68,426	349,325
Parry Sound ..	14,997	15,176	11,271	13,088	17,223	21,695	93,450
Peel	60,639	28,189	28,173	23,098	19,635	22,549	182,283
Perth	81,255	77,102	48,739	50,624	50,789	57,493	366,002
Peterborough ..	28,366	26,243	19,924	16,520	20,206	29,706	140,965
Prescott and Russell	51,954	48,103	34,091	30,761	32,333	31,165	228,407
Prince Edward ..	10,524	6,949	5,841	5,380	5,067	6,504	40,265
Rainy River	24,578	41,191	22,050	21,040	21,072	26,215	156,146
Renfrew	30,681	24,482	20,572	19,169	21,561	21,836	138,301
Simcoe	73,389	68,142	39,393	42,807	46,039	53,382	323,152
Stormont, Dundas and Glengarry ..	92,953	100,964	56,749	59,803	63,134	57,808	431,411
Sudbury	16,998	19,516	15,950	19,539	17,849	22,059	111,911
Thunder Bay	32,066	43,755	23,586	21,803	29,314	27,412	177,936
Temiskaming	8,181	15,436	13,047	13,331	9,217	62,699	121,911
Victoria	36,940	36,137	28,145	29,304	25,730	23,621	179,877
Waterloo	63,102	31,338	17,642	24,821	22,258	25,948	185,109
Welland	47,602	71,336	32,209	37,030	34,463	33,469	256,109
Wellington	73,089	59,104	30,418	32,295	30,716	42,836	268,459
Wentworth	90,352	101,788	32,124	34,447	34,377	44,768	337,856
York	215,656	243,757	129,295	119,635	121,757	91,441	921,541
Total	2,761,702	2,615,137	1,680,187	1,730,689	1,615,790	1,768,785	12,172,290

APPENDIX B

Expenditure on County Roads

The following Schedule shows in detail the work and approved expenditure on County

County.	Work done during year								Approved	
	Miles graded	Miles stoned	Miles gravelled	Tile Drain. rods	Bridges	Pipe and Tile Culverts	Other Culverts	Roads and Culverts	Bridges	
								\$ c.	\$ c.	
Wentworth		5.80		12	1	4	7	31,301 47	3,308 12	
Lanark		7.00	0.25		2	4		19,800 85	26,949 51	
Simcoe			0.75		2	23	2	6,405 56	13,478 22	
Wellington	6.81	1.59	2.75	43	7	45	2	15,092 03	14,501 16	
Lincoln	53.75	14.00	2.50			80	14	137,059 12		
Oxford	5.00	2.50	5.00	150	2	38		23,275 05	2,097 75	
Hastings					1				1,120 29	
Peel	2.40					23		5,714 02		
Middlesex	1.85		17.40	804		14	8	38,701 06		
Lennox & Addington		0.25						1,291 85		
Prince Edward				20				976 21		
Halton	1.50	1.75	0.25		1	12	7	11,061 85	40,007 26	
Perth	3.75	1.18	4.94	1,081	1	7		16,676 49	2,858 78	
Frontenac	2.62	3.50		42	3	27		14,869 19	3,040 63	
Waterloo	1.65	2.25	11.90	67	3	9	1	23,016 81	5,725 53	
Carleton	4.25	5.19	7.86		2	18	2	34,798 77	25,143 50	
Leeds and Grenville	1.95	5.25		6		8	9	23,426 82		
York	6.72	9.18		279	5	27	39	164,706 93	11,295 38	
Haldimand	92.25					100	1	12,763 71		
Welland	12.20	11.03				19	19	37,978 64		
Essex	2.66			48	3		9	7,471 62	16,642 02	
Prescott & Russell					7	7		3,291 63	71,378 52	
Stormont, Dundas and Glengarry		21.66			8		7	97,984 84	14,765 50	
Brant	6.30	0.08	2.50	511	1	18	1	10,458 98	4,702 06	
Victoria	12.50		6.25	20		18	5	5,031 46	1,805 45	
Huron	0.25		3.38	280	5	1	4	7,031 15	15,162 92	
Bruce	70.00		16.00	36	6	14	10	17,277 80	10,394 91	
Ontario	6.10	0.80	7.25		1	7	4	11,249 33	2,281 35	
Norfolk	0.07			10	2	9	1	3,683 54	4,820 56	
Kent				1,700	8	13	11	12,866 92	8,577 69	
Elgin	7.85	2.00	13.90	64	4	40	9	28,661 22	12,595 67	
Renfrew	5.50		0.11		2	10	3	5,457 86	5,397 95	
Grey					4	45		1,553 83	6,732 00	
Dufferin	1.44				1	15	1	2,022 30	3,742 50	
Lambton	1.28		1.00	239	4	9	9	3,418 19	17,758 84	
Northumberland and Durham	10.00		10.00		2	8	4	18,913 04	2,000 06	
Totals	320.65	98.01	113.99	5,412	88	672	189	855,290 14	348,264 13	

APPENDIX B

(Not including Provincial County Roads)

Roads during 1918, upon which Provincial subsidies were paid in 1919

Expenditure for year				Construction		Maintenance		Construction and Maintenance
Machinery and Repairs	Special Grants	Superintendence	Purchases of Toll Roads and Gravel Pits	Total Approved Expenditure	Government Grant 40%	Total Approved Expenditure	Government Grant 20%	Total Government Grant
\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
1,901 93		3,267 81		39,779 33	15,911 73	24,243 96	4,848 79	20,760 52
1,739 20		1,816 16		50,305 72	20,122 29	14,972 46	2,994 49	23,116 78
302 69	6,343 61	2,034 25		28,564 33	11,425 73	32,394 22	6,478 84	17,904 57
2,328 60	3,082 18	2,492 84		37,496 81	14,998 72	24,698 52	4,939 70	19,938 42
13,503 15		2,471 31		153,033 58	61,213 43	15,823 39	3,164 68	64,378 11
2,811 55	3,250 00	2,248 44		33,682 79	13,473 12	13,789 70	2,757 94	16,231 06
279 05		3,356 21		4,755 55	1,902 22	29,170 53	5,834 11	7,736 33
1,303 30		1,389 25		8,406 57	3,362 63	7,378 93	1,475 79	4,838 42
374 56	1,000 00	2,260 00		42,335 62	16,934 25	25,313 46	5,062 69	21,996 94
1,334 40	3,010 46	1,259 95		6,896 66	2,758 66	11,504 46	2,300 89	5,059 55
1,551 51	1,402 51	1,714 25		5,644 48	2,257 79	19,807 33	3,961 47	6,219 26
309 28		1,128 96		52,507 35	21,002 92	7,825 08	1,565 02	22,567 94
113 48		940 00		20,588 75	8,235 50	6,114 63	1,222 93	9,458 43
880 19		1,451 98		20,241 99	8,096 80	11,517 78	2,303 56	10,400 36
801 67	7,000 00	2,053 78		38,597 79	15,439 12	14,036 88	2,807 38	18,246 50
14,632 60		1,552 75		76,127 62	30,451 05	8,143 95	1,628 79	32,079 84
701 14	483 60	2,013 31	9,000 00	35,624 87	14,249 95	7,137 20	1,427 44	15,677 39
1,460 89		3,551 87		181,015 07	72,406 03	32,838 89	6,567 78	78,973 81
941 00	199 16	1,974 73		15,878 60	6,351 44	17,741 62	3,548 32	9,899 76
9,546 08		1,809 04		49,333 76	19,733 50	38,142 10	7,628 42	27,361 92
317 65		1,809 13		26,240 42	10,496 17	6,323 54	1,264 71	11,760 88
1,451 79		2,173 52		78,295 46	31,318 18	6,428 20	1,285 64	32,603 82
2,085 38		2,768 46		117,604 18	47,041 67	30,102 22	6,020 44	53,062 11
1,246 79		2,145 37	4,000 00	22,553 20	9,021 28	15,289 21	3,057 84	12,079 12
1,262 24	7,001 87	1,767 93		16,868 95	6,747 58	8,067 07	1,613 41	8,360 99
6,832 50		2,055 03		31,081 60	12,432 64	21,792 98	4,358 60	16,791 24
3,368 83	2,165 98	2,955 58		36,163 10	14,465 24	6,182 59	1,236 52	15,701 76
6,266 57		1,469 74		21,266 99	8,506 80	17,258 96	3,451 79	11,958 59
4,864 96		2,021 58		15,390 64	6,156 26	7,957 36	1,591 47	7,747 73
1,287 71		2,492 97		25,225 29	10,090 12	27,084 64	5,416 93	15,507 05
4,227 49	2,018 18	2,018 66	860 72	50,381 94	20,152 78	20,587 97	4,117 59	24,270 37
2,032 03		1,816 16		14,704 00	5,881 60	8,688 83	1,737 77	7,619 37
		2,413 54		10,699 37	4,279 75	16,648 28	3,329 65	7,609 40
		533 80		6,298 60	2,519 44	7,653 94	1,530 79	4,050 23
1,715 36		1,219 23		24,091 62	9,636 65	6,807 68	1,361 53	10,998 18
984 38	5,779 27	1,246 45		28,923 20	11,569 28	18,978 07	3,795 61	15,364 89
94,759 95	42,736 82	71,694 04	13,860 72	142,660 5	80,570,642 32	588,446 61	117,689 32	688,331 64

APPENDIX C

Expenditure on

The following Schedule shows in detail the work and approved expenditure on Provincial

Work done during year

County	Work done during year					
	Miles graded	Miles gravelled	Tile drain, rods	Bridges	Pipe and Tile Culverts	Other Culverts
Wentworth.....						2
Simcoe.....						
Wellington.....				1		
Oxford.....						
Hastings.....						
Peel.....	0.20		206		8	
Middlesex.....			10	1	1	1
Lennox and Addington.....						
Prince Edward.....						
Prescott and Russell.....				1		
Stormont, Dundas and Glen- garry.....						
Huron.....						
Norfolk.....					9	1
Elgin.....		2.25	116	1	6	3
Grey.....						
Dufferin.....	0.10				4	
Lambton.....	0.5	0.23		1	2	
Northumberland and Dur- ham.....						2
Total.....	0.35	2.48	332	5	30	9

APPENDIX C

Provincial County Roads

County Roads during 1918, upon which Provincial subsidies were paid during 1919.

Approved expenditure for year

Roads and Culverts	Bridges	Construction	Maintenance	Total Approved Expenditure	Government Grant 60%
\$2,240 63	.....	\$2,240 63	\$5,368 37	\$7,609 00	\$4,565 40
.....	.....	.....	7,319 16	7,319 16	4,391 50
.....	11,613 49	11,613 49	6,178 53	17,792 02	10,675 21
.....	.....	.....	3,382 63	3,382 63	2,029 58
.....	.....	.....	14,732 24	14,732 24	8,839 34
2,302 92	.....	2,302 92	17,268 61	19,571 53	11,742 92
2,866 77	1,266 78	4,133 55	21,655 54	25,789 09	15,473 45
.....	.....	.....	2,662 77	2,662 77	1,597 66
.....	.....	.....	13,239 96	13,239 96	7,943 98
.....	10,577 00	10,577 00	3,268 32	13,845 32	8,307 19
.....	.....	.....	21,312 25	21,312 25	12,787 35
.....	.....	.....	6,490 72	6,490 72	3,894 43
3,001 58	.....	3,001 58	6,478 89	9,480 47	5,688 28
7,337 84	5,697 12	13,034 96	12,873 50	25,908 46	15,545 08
.....	.....	.....	7,247 82	7,247 82	4,348 69
510 55	834 91	1,345 46	2,653 91	3,999 37	2,399 62
2,181 67	4,243 36	6,425 03	1,711 11	8,136 14	4,881 68
1,329 88	.....	1,329 88	1,998 44	3,328 32	1,996 99
\$21,771 84	\$34,232 66	\$56,004 50	\$155,842 77	\$211,847 27	\$127,108 35

APPENDIX D—SCHEDULE 1

PROVINCIAL HIGHWAY COSTS

1918-1919

	Construction		Maintenance		Grand Total	
	Total Cost	Municipal Contribution	Total Cost	Municipal Contribution	Total Cost	Municipal Contribution
Pickering, Twp.....	\$9,734 50	\$2,920 35	\$2,999 80	1,199 94	\$13,734 30	\$4,120 29
Whitby, West, Twp.....	1,039 56	311 86	829 34	248 80	1,868 90	560 66
Whitby, East “	2,114 76	634 42	6,104 26	1,831 27	8,219 02	2,465 69
Darlington “	1,312 22	393 67	4,291 40	1,287 42	5,603 62	1,681 09
Clarke “	4,291 72	1,287 52	1,311 09	393 31	5,602 81	1,680 83
Hope “	6,787 94	2,036 38	3,584 99	1,075 50	10,372 93	3,111 88
Whitby, Town	1,587 83	476 34	2,727 03	818 11	4,314 86	1,294 45
Newcastle, Village.....	1,098 44	329 53	553 99	166 19	1,652 43	495 72
Bowmanville, Town	11,174 31	6,704 59	253 55	76 06	11,427 86	6,780 65
Ontario, County .....	.....	.....	696 77	209 03	696 77	209 03
Pickering, Village.....	.....	.....	301 76	90 53	301 76	90 53
N. Fredericksburg, Twp.	183 90	55 17	4,472 69	1,341 80	4,656 59	1,396 97
Louth, Twp.....	1,708 47	512 54	4,409 30	1,322 79	6,117 77	1,835 33
Oxford, Twp.....	1,433 53	430 06	3,415 58	1,024 67	4,849 11	1,454 73
Saltfleet, Twp	2,055 05	616 51	5,259 14	1,577 74	7,814 19	2,194 25
Grantham “	2,299 42	689 82	2,884 93	865 48	5,184 35	1,555 30
Brighton, Village.....	83 62	25 09	1,714 57	514 36	1,798 19	539 45
Sidney, Twp.....	.....	.....	2,634 46	790 34	2,634 46	790 34
Colborne, Village.....	134 50	40 35	1,300 10	390 03	1,434 60	430 38
Edwardsburg, Twp.....	10 80	3 23	1,772 19	531 66	1,782 99	534 89
Kingston “	36 10	10 83	3,768 94	1,130 68	3,805 04	1,141 51
Cramahe “	120 90	36 27	2,641 92	792 58	2,762 82	828 85
Brighton “	22 00	6 60	5,590 07	1,677 02	5,612 07	1,683 62
Murray “	3 00	90	4,693 73	1,408 12	4,696 73	1,409 02
Grimsby North “	2,163 35	649 00	2,993 45	898 03	5,156 80	1,547 03
Clinton “	1,659 85	497 95	2,235 23	670 57	3,895 08	1,168 52
Haldimand “	135 10	40 53	2,900 23	870 07	3,035 33	910 60
Niagara “	1,426 60	427 98	694 70	208 41	2,121 30	636 39
North Gower “	194 45	58 33	1,322 95	396 88	1,517 40	455 21
Nepean, Twp	590 25	177 07	745 87	223 76	1,336 12	400 83
Ernestown, Twp .....	.....	.....	5,970 51	1,791 15	5,970 51	1,791 15
Total	\$53,402 17	\$19,372 89	\$86,074 54	\$25,822 30	\$139,476 71	\$45,195 19
Purchase of Cobourg and Port Hope Toll Road, Apportionment of Cost						
Durham and Northumberland, Counties (25%)..		\$2,000 00				\$2,000 00
Port Hope, Town (9%)..		720 00				720 00
Cobourg “ (9%)..		720 00				720 00
Hope, Township (3%)..		240 00				240 00
Hamilton “ (14%)..		1,120 00				1,120 00
Total	\$8,000 00	\$4,800 00			\$8,000 00	\$4,800 00
Machinery Account					31,873 83	
Property					4,139 39	
Grand Total.....	\$61,402 17	\$24,172 89	\$86,074 54	\$25,822 30	\$183,489 93	\$49,995 19

APPENDIX D—SCHEDULE 2

PROVINCIAL HIGHWAY CONSTRUCTION (Cost Details)

1918-1919

	Earth Work	Tile and Pipe Drainage	Road Surface	Bridges and Culverts	Guard Rail and Catch- Basins	Material, Road Foundation	Credits	Grand Total	Amount due from Municipality 30 %	
Pickering, Twp.	\$4,820 99	\$62 18	.....	\$5,198 63	\$20 46	.....	\$367 76	\$9,734 50	\$2,920 35	Lumber transferred to Hope Twp., Bowmanville and Newcastle.
Whitby, West Twp.	954 35	.....	.....	82 21	3 00	.....	.....	1,039 56	311 86	Newcastle.
Whitby, East " ..	1,202 05	.....	.....	1,112 71	.....	.....	200 00	2,114 76	634 42	Lumber transferred to Pickering Twp.
Darlington " ..	649 60	.....	.....	617 97	44 65	.....	.....	1,312 22	393 67	
Clarke " ..	1,959 16	.....	.....	2,302 06	30 50	.....	.....	4,291 72	1,287 52	
Hope " ..	3,138 95	.....	.....	3,825 81	59 65	.....	236 47	6,787 94	2,036 38	Lumber transferred East
Whitby, Town	1,325 25	.....	.....	262 08	50	.....	.....	1,587 83	476 34	Whitby and refund Canada
Newcastle " ..	744 75	.....	.....	341 19	12 50	.....	.....	1,098 44	329 53	Cement Co.
Bowmanville, Town ..	1,125 66	.....	.....	5 00	.....	.....	.....	11,174 31	6,704 59	
Bridge 4,951 + 50 ..	.....	.....	.....	7,177 21	.....	.....	.....	.....	.....
..... 4,960 + 00 ..	.....	.....	.....	2,866 44	.....	.....	.....	.....	.....
North Fredericksburg, Twp.	123 90	.....	.....	60 00	.....	.....	.....	183 90	55 17	
Louth, Twp.	1,391 85	.....	.....	142 95	173 67	.....	.....	1,708 47	512 54	
Oxford " ..	365 28	.....	141 50	.....	.....	926 75	.....	1,433 53	430 06	
Saltfleet " ..	1,808 30	54 90	.....	191 85	.....	.....	.....	2,055 05	616 51	
Grantham, Twp.	1,499 45	384 92	.....	415 05	.....	.....	.....	2,299 42	689 82	
Brighton, Village ..	51 50	.....	.....	32 12	.....	.....	.....	83 62	25 09	
Colborne, Village, ..	42 50	.....	.....	92 00	.....	.....	.....	134 50	40 35	
Edwardsburg, Twp. " ..	5 55	.....	.....	1 65	3 60	.....	.....	10 80	3 23	
Kingston " ..	33 10	.....	.....	3 00	.....	.....	.....	36 10	10 83	
Cambridge " ..	110 90	.....	.....	10 00	.....	.....	.....	120 90	36 27	
Brighton " ..	13 00	.....	.....	.....	9 00	.....	.....	22 00	6 60	
Murray " ..	2 00	.....	.....	.....	.....	.....	.....	3 00	90	
Grimsby North " ..	2,021 60	.....	.....	141 75	.....	.....	.....	2,163 35	649 00	
Clinton " ..	1,659 85	.....	.....	.....	.....	.....	.....	1,659 85	497 95	
Haldimand " ..	135 10	.....	.....	.....	.....	.....	.....	135 10	40 53	
Niagara " ..	1,347 85	.....	.....	78 75	.....	.....	.....	1,426 60	427 98	
North Gower " ..	.....	.....	77 45	.....	.....	117 00	.....	194 45	58 33	
Nepean " ..	590 25	.....	.....	.....	.....	.....	.....	590 25	177 07	
Total	\$27,123 74	\$502 00	\$218 95	\$24,960 43	\$357 53	\$1,043 75	\$804 23	\$53,402 17	\$19,372 89	

APPENDIX D—SCHEDULE 3 PROVINCIAL HIGHWAY MAINTENANCE (Cost Details)

1918-1919

	Earth work		Road surface		Bridges and Culverts		Guard rail and catch basins		Cleaning, weed cutting and removal of snow		(Credits)		Grand Total		Amount due from Municipality, 30%	
	\$	c.	\$	c.	\$	c.	\$	c.	\$	c.	\$	c.	\$	c.	\$	c.
Pickering, Twp.			3,831	23	212	82		46	25				3,999	80	1,199	94
Whitby, West, Twp.			813	24	16	10							829	34	248	80
Whitby, East, Twp.			5,943	22	149	94		3	00	8	10		6,104	26	1,831	27
Darlington, Twp.			4,275	70				6	20	9	50		4,291	40	1,287	42
Clarke, Twp.			1,181	78	8	00		14	50	106	81		1,311	09	393	31
Hope, Twp.			3,267	62	106	34		47	66	163	37		3,584	99	1,075	50
Whitby, Town			2,725	53				1	50				2,727	63	818	11
Newcastle, Village			544	99				9	00				553	99	166	19
Boxmanville, Town			253	55									253	55	76	06
Ontario, County					696	77							696	77	249	63
Pickering, Village			301	76									301	76	90	53
North Fredericksburg, Twp.	864	10	3,608	59									4,472	69	1,341	80
Louth, Twp.			4,241	50	159	55		8	25				4,409	30	1,322	79
Oxford, Twp.			3,363	28	43	85		8	45				3,415	58	1,024	67
Saltfleet, Twp.			5,259	14									5,259	14	1,577	74
Grantham, Twp.			2,884	93									2,884	93	865	48
Brighton, Village			1,714	57									1,714	57	514	36
Sidney, Twp.			2,533	56				100	90				2,634	46	790	34
Colborne, Village			1,300	10									1,300	10	390	03
Edwardsburg, Twp.	113	90	1,635	19	23	10							1,772	19	531	66
Kingston, Twp.			3,763	99	4	95							3,768	94	1,130	68
Cramahle, Twp.			2,595	60	5	00		41	32				2,641	92	792	58
Brighton, Twp.			5,588	57	1	50							5,590	07	1,677	02
Murray, Twp.			4,685	45	5	00		3	28				4,693	73	1,408	12
Grimshy North, Twp.			2,291	25	21	00							2,993	45	898	05
Clinton, Twp.	1	20	2,231	53				3	70				2,235	23	670	57
Haldimand, Twp.			2,807	35	13	14		79	74				2,900	23	870	07
Niagara, Twp.			692	90				1	80	288	90		694	70	208	41
North Gower, Twp.			1,034	05									1,322	95	396	88
Nepean, Twp.			745	87									745	87	225	76
Ernestown, Twp.			4,348	30									5,970	51	1,791	15
Total	\$2,601	41	\$81,144	34	\$1,467	06	\$375	55	\$634	35	\$148	17	\$86,074	54	\$25,822	30

APPENDIX E

REPORTS OF COUNTY ROAD INSPECTION

TORONTO, April 26th, 1919.

W. A. McLEAN, Esq.,
Deputy Minister of Highways, Ontario.

SIR,—

Herewith I beg to submit a report on the work carried out on County Roads during the year 1918 in the Counties of Brant, Bruce, Elgin, Grey, Lanark, Stormont, Dundas and Glengarry, Victoria and Wentworth, in accordance with the provisions of the Highway Improvement Act.

All of which is respectfully submitted.

WIMUND HUBER.
Assistant Engineer.

BRANT

The second year of operation in Brant County under the Highway Improvement Act witnessed a continuation of the policy laid down during the first year, viz., the bringing of the roads of the system to a passable condition by substantial grading operations. As in many other counties, the main roads, prior to the designation of the system, had fallen into serious disrepair, and the county's problem has been mainly to improve conditions generally rather than embark on any extensive programme of heavy construction work. Preliminary grading was carried on over a large mileage, and much work done which will contribute to the final construction of the roads.

Practically all heavy grading has been done with tractors, Brant county being among the first in the Province to engage in this class of work. During 1917 the county purchased and operated two 8-16 h.p. kerosene tractors. These, while giving fair satisfaction on light trimming operations, were soon found to be inadequate for the heavier work, with the result that early in 1918 one was exchanged for a 10-20 h.p. machine. While the latter is an improvement on the smaller size, the consensus of opinion, based also on observations in other counties where larger machines are operated, appears to favour a still heavier and more powerful tractor, especially on heavy soils or where heavy cutting is desirable. Average daily operating costs of the larger outfit above mentioned have been as follows:

Fuel—15 gals. kerosene at 18c.	\$2 70
Oil—½ gal. at 70c.	0 35
Operator on tractor	4 00
Operator on grader	4 00
Repairs, etc.	0 50
Total	\$11 55

A day's work with the 8-16 h.p. tractor was from ¼ to ½ mile, while with the 10-20 h.p. machine from ¼ to ½ mile was done, depending on the season, previous condition of the road, character of soil, amount of work required, etc.

Experience with even the smaller sizes of tractors has demonstrated the superiority of this method of conducting grading operations over the employment of teams, both as regards cost of operation and work accomplished. The employment of more powerful tractors will show them up to even greater advantage.

The principal piece of road construction, in addition to the grading mentioned, was the resurfacing of approximately two miles of the Burford Road with crushed gravel. The material used was obtained at a pit recently purchased by the county and possesses extraordinary binding properties making it particularly suitable, when crushed, for road work. The gravel was not rolled, but careful attention during consolidation has left it with a uniform, though somewhat excessive, crown. Considering the heavy traffic on the road, the width of gravel, which is now approximately ten feet, might be considerably increased.

BRUCE

Construction work in Bruce County during 1918 consisted largely of concrete bridge and culvert construction, the year's work including six bridges of from 10-foot to 60-foot span and ten reinforced concrete slab top culverts. Future traffic requirements have been anticipated by constructing these with generous widths of roadway, the

culverts having 30 feet and the bridges 20 feet. The structures are all of substantial design, but their appearance is somewhat marred by a poor finish. Road construction was limited to preliminary grading and light gravelling, the greater part of the latter being intended to assist in preserving the shape of the newly graded road rather than to provide a metalled surface. Where gravel has been applied in substantial amounts, the tendency has been to deposit it in a narrow deep row in the middle of the road, leaving a ridge which the traffic seeks to avoid, rather than in a reasonably wide coat of moderate depth which traffic could more easily consolidate. Future gravelling will be performed by distributing the metal to a greater width with less depth, and applying a second course if necessary.

Maintenance and repair of county roads consisted largely in grading operations, the greater part of the work comprising the removal of sod shoulders, cleaning ditches, and otherwise improving the drainage. Some gravel was also applied in small quantities to remove ruts and depressions in the surface and make the roads temporarily more comfortable for traffic.

The greater part of the grading operations, both in construction and in maintenance, was carried on with a kerosene tractor rated at 12-24 h.p. While giving fair satisfaction on light grading and trimming operations, this tractor was found to lack the power necessary for heavy work, with the result that the purchase of larger machines is under consideration. The cost of operation of the said tractor, including operator, fuel, and an allowance for repairs, was approximately \$15.00 per day. Progress was



THE PROVINCIAL HIGHWAY IN ITS ORIGINAL CONDITION.

Lack of drains to remove sub-surface water is responsible for many similar sections of road in the spring. Open drains of suitable depth and capacity should be provided.

made at the rate of from one-half mile to one mile per day, according to the condition of the road and the amount of work done.

Road construction over the greater part of the Bruce County System is largely a matter of grading, hauling gravel, spreading on the road, and keeping the surface properly rounded during consolidation, which last named operation may be cheaply and efficiently done with a road drag or light grader. In a number of cases, the gravel is so coarse as to necessitate crushing in order to provide suitable road material. While excellent gravel may be obtained in nearly all parts of the county, the distribution is such that some long hauls will be necessary, for which traction outfits should be used.

Bruce County's road organization follows closely the lines recommended by this Department. The Road Superintendent acts under the direction of a committee of three, who hold regular monthly meetings for the purpose of passing accounts and general business, and also such special meetings as may be necessary. A commendable feature of this committee is its permanent character, having been appointed to hold office during the pleasure of the county council, and not necessarily consisting of members of the council. A committee of this size and character is found much more satisfactory than a larger one, or one appointed annually. The expense to the county is less, it is more easily convened, and can move from place to place within the county with greater facility. Its permanence guarantees to the county the benefit of experience gained from year to year, and increases its value as time passes. The county's system of passing, paying and recording accounts is in accordance with the recommendations of this Department.

ELGIN

Following the policy laid down at the time of assuming the County Road System, expenditure in Elgin County during 1918 was confined to maintenance operations over the whole system, the construction of a number of bridges which could no longer be delayed, and only such road construction as was absolutely necessary.

During the year the organization, commenced in 1917, was perfected, and now follows very closely the lines recommended by this Department. The County Road Superintendent acts under the general direction of a County Road Committee of five members who meet at the call of the Chairman or of the Road Superintendent. Frequent meetings during the year, averaging two per month, enable the Committee to keep in close touch with the work, thus considerably increasing its efficiency as a committee. All accounts and pay lists, after being certified by the Superintendent, are passed by the Committee and payment made by cheque by the County Treasurer. In the case of pay lists, individual cheques, payable at par at all branch banks throughout the county, are made out to the workmen and distributed through the various foremen. This method of payment, eliminating as it does the handling of any cash by county officials or employees, is facilitated by the general distribution of branch banks in all parts of the county, and has worked out satisfactorily to all concerned.

Certain parts of Elgin County are destitute of local road material, and with a view to facilitating the distribution of gravel which occurs in large quantities in some sections, and which will constitute the principal road building material, a large pit of excellent gravel has been purchased in Yarmouth Township with the intention of transporting the gravel by rail to such districts as are not locally supplied. The county's intention is to establish storage yards at central points at which ample supplies of the material may be kept for local use. The first steps toward the development of the pit will be the erection of a storage bin, already commenced, with a capacity of approximately six carloads, and the installation of a screening plant to remove large stones and excess quantities of sand. The operation of a screening plant may be carried on at approximately the same cost as an ordinary loading outfit and will insure gravel of the proper quality, and will prevent loss through the payment of freight charges on unsuitable material.

Actual construction work in 1918 consisted mainly of preliminary grading work over a considerable mileage, some hill improvement, and the construction of six concrete bridges and thirteen concrete slab culverts. The bridges include two arches of 20-foot and 40-foot spans respectively, three beam bridges of 40-foot span and a 10-foot concrete slab bridge. A commendable feature of the culverts is their generous width, all being built with from 22-foot to 28-foot roadways. The bridges were built by contract and the culverts by day work, the county keeping a culvert-building crew continuously employed.

A system of county road maintenance has been inaugurated, which is giving good results. Approximately 75 patrolmen have been appointed for road dragging and general repair work. For patrol purposes the system is divided into sections of from two to six miles, with an average length of four miles. For work requiring more than one man or one team the patrolmen are empowered to engage extra assistance.

The use of the road drag has been well developed in Elgin County. Special care is given the existing gravel roads, with the result that many of them are among the best in the Province. By intelligent and systematic dragging, the majority of the roads are kept in fair condition pending their reconstruction, and the necessity for such reconstruction is in many cases deferred, enabling the county to devote more attention to the solution of its more urgent problems.

GREY

Work on the Grey County Road System was commenced in 1918, but owing to war conditions no permanent work, other than necessary bridge and culvert construction, was attempted. A good beginning was made toward securing an efficient maintenance organization, which, with the improvement which may be expected to accompany experience gained during the second season, should be capable of keeping the roads of the system in reasonably good condition pending permanent construction. A foreman has been appointed in each township to supervise all maintenance work within the township, with authority to engage such help as may be necessary from time to time. These foremen, who are held responsible for the condition of the county roads in their respective territories, have been selected largely from among the most efficient pathmasters in the several townships, and all have had more or less experience on road maintenance. The Superintendent has endeavoured to further increase the efficiency of his maintenance organization by keeping in as close touch with the work as its magnitude would permit. The County Road System is somewhat handicapped, and the work of maintenance seriously retarded, by an excessive mileage, which includes many roads which cannot be considered of more than local importance, and others which,

prior to being assumed by the county, had been badly neglected by the townships having jurisdiction over them.

A part of the maintenance on the Provincial County Road south of Owen Sound is worthy of special mention. An old gravel road, once heavily metalled, it had become badly worn, flat and rutted. The travelled surface was loosened by spiking with a roller rented from the town, the road reshaped with a grader, a small amount of new gravel added where necessary, and the whole re-rolled. Sod shoulders were removed with the grader and turned outward, and the ditches cleaned. While such work can be considered as only temporary, the great improvement to the road more than justifies the cost, which was approximately \$150.00 per mile.



STEEL AND CONCRETE BRIDGE AT BOWMANVILLE.
On the Provincial Highway.

Except in the case of a few townships in the north, gravel, which occurs in large quantities in nearly all parts of the county, will be the only road material. Much of the gravel, however, while of excellent road-building quality, is too large and will require to be crushed. Especially on long hauls is crushing desirable, in order that the haulage shall not include the transportation of unsuitable material.

The county's organization provides for a County Road Committee of five members, selected from the county council, who meet monthly, or as occasion requires, and whose duty is to direct the Road Superintendent, who acts under their instructions, and to pass accounts after they have been certified and classified by the Superintendent.



NEW BRIDGE AT BOWMANVILLE ON THE PROVINCIAL HIGHWAY.

Accounts, after being passed by the committee, are paid by cheque by the Treasurer. In the case of paying workmen, cheques for the total amount of each pay list are issued to the respective foremen, who pay the men in cash.

During the season of 1918 no machinery was purchased, all work being done with equipment rented from the townships. Realizing that the best results can be secured only when the county operates its own machinery, the county purposes to make extensive purchases for the season of 1919, and construction work on an extensive scale is anticipated.

LANARK

The original County Road System, work on which was commenced in 1903, was practically completed in 1914, and a start has been made toward improvement of the additional county roads designated in 1916. The work of 1918 includes as its principal item of road construction the macadamizing of two miles of the Perth-Smith's Falls road, commencing at the easterly boundary of Perth. While the roads of the original system were all constructed without the aid of a roller, and creditable results obtained through special attention to the stone during the process of consolidation, yet the superior class of work resulting from the use of a steam roller on this section, and on a section constructed in 1917, have justified the more up-to-date methods, and have decided the county to make more extensive purchases of machinery for the coming season. While the majority of roads in Lanark County have been metalled to a width of 8 to 10 feet, the necessity for a wider road on this link connecting two main centres has been recognized, and a macadam wearing surface 16 feet wide has been laid. Stone was quarried and crushed in the immediate vicinity of the road, resulting in a short haul. The consolidated depth of stone over the whole road was eight inches or more. Including a considerable amount of heavy grading, the cost was approximately \$5,785.00 per mile. One mile of macadam road, 16 feet wide, in the uncompleted gap between Carleton Place and Almonte, was also constructed at a cost of approximately \$3,500.00.



THE OLD BRIDGE AT BOWMANVILLE.

Replaced by the steel and concrete structure shown on the opposite page.

The other large item of expenditure was the construction of a bridge over the Mississippi River at Lot 7, Concession XI, Drummond Township, known as McIlquham's Lower Bridge, at a cost of \$25,200.00. The total length of the structure is 339 feet between abutments, divided into eight steel girder spans of approximately 42 feet each on piers 14 feet in height. The river at this point is shallow and runs over bedded limestone, affording an excellent foundation for the piers.

Lanark County System includes approximately 100 miles of road already surfaced, and a patrol crew, devoting the greater part of its time to maintenance and resurfacing, has been organized. As many of the roads have not been subjected to severe traffic conditions, the use of a roller on these roads either in construction or maintenance has not been considered necessary. The method of resurfacing consists of applying crushed stone, either quarried limestone or fieldstone, depending on the local supply, 1½ inches or less in size, spreading on the road and carefully maintaining the crown and filling any ruts which may develop by means of raking or dragging. Earth shoulders are trimmed and the ditches cleaned at the same time. The county's policy is to do this resurfacing work before the road has worn to such an extent as to necessitate reconstruction. The cost of work carried on by this crew usually varies from \$700 to \$1,250 per mile.

Minor repairs and grading and dragging on roads not reached by the resurfacing crew are carried on by an organization of 66 patrolmen who devote to the work such time as may be required, giving special attention to emergency repairs. The average patrol section is from 4½ to 5 miles in length.

STORMONT, DUNDAS AND GLENGARRY

The season's work in the United Counties of Stormont, Dundas and Glengarry consisted principally of substantial grading and preliminary surfacing with crushed stone or gravel. A large part of the county road mileage consists of roads which have never been metalled, or on which the surface has become so worn as to constitute practically earth roads. On approximately 30 miles of such roads, selected from among the worst sections on the system, after careful grading, a course of crushed fieldstone 9 feet wide and 6 to 8 inches deep was placed, the greater part being finished by rolling. Work of this kind is not considered as final, but is intended to serve as a foundation for future construction. While done at a comparatively low cost, the condition, in the early spring of 1919, of a number of the sections treated as described indicates that they have successfully withstood a winter notable for its severe effects on roads in general. The average cost of the aforementioned work, nearly all of which was done by contract, using local fieldstone, was approximately \$2,500 per mile on the less important sections where no rolling was done, and \$3,500 per mile for rolled and waterbound road. Gravel was used on one three-mile section, the cost being about \$2,000 per mile. The cost of grading and ditching is included in each case.



A PERMANENT SUPERSTRUCTURE ON TEMPORARY FOUNDATION.

This stone bridge abutment is characteristic of many bridge abutments, in that the foundation was not carried to a sufficient depth, and has been undermined.

Work on the Provincial County Road partook of the nature of heavy maintenance, consisting of grading and the application of a light course of crushed stone.

Apart from a dozen standard graders, used largely for maintenance purposes, and a number of drags, purchased in 1918, the counties own no road building equipment, and with the exception of two short sections, built with rented machinery, construction work was carried on by contract. For this reason relative costs of contract work and day work are not available. To obtain an intelligent comparison between the two methods, it is desirable that the counties purchase a number of complete outfits and operate them under conditions as nearly as possible similar to those under which contract work is being carried on.

Bridge construction included the erection or completion of eight concrete beam spans of from 10 to 32 feet, and one 80-foot steel truss on concrete abutments. In the case of the concrete bridges, more care in the placing of the concrete would have resulted in a much improved appearance at practically no extra cost.

The organization for maintenance provides for a foreman in each township, twelve in all, who is given a general oversight over all maintenance work within his territory, with authority to engage assistance as required. Each foreman is supplied with a grader and a number of road drags, and a special effort is made to go over all the county roads in his section at the earliest opportunity in the spring, and to drag the roads as often as possible thereafter as may be necessary. With the object of bringing the foremen into closer touch with each other, familiarizing them with their work,

and securing uniformity of results, a conference was held in March, 1918, along similar lines to those of the annual conference of County Road Superintendents conducted by the Department of Public Highways. The subjects presented and discussed were those of special interest to the men assembled and included: "Road Improvement in Ontario"; "Types of County Roads"; "County Road Maintenance"; "Time Keeping and Reports." The interest manifested in the conference and the results obtained were such as to justify the suggestions of similar gatherings in other counties.

Local conditions in these counties present two problems: narrow road allowances, and lack of drainage; and in many localities road construction to a satisfactory standard must be preceded by a widening of the road allowance, or by drainage operations under the Municipal Drainage Act, or both. Some progress has already been made toward having farm fences set back to give a width of at least 66 feet. In many instances the additional land required for the full width has been given to the county free of charge; in others, an agreement has been made to move the fences within a given number of years, or when they require renewal; while in the most obstinate cases, expropriation will be necessary.

Full advantage has also been taken of recent legislation permitting the County Road Superintendent to institute proceedings under the Ditches and Watercourses Act, and a number of minor drainage difficulties have been met in this way.

Under the counties' organization, the Road Superintendent acts under the direction of a County Road Committee of seven, selected from the standing committee on Roads and Bridges of the County Council. Under such an arrangement the Committee is assured of no degree of permanence, and planning of a continuous programme in advance, covering a number of years' operations, is impossible. Greater continuity of work, and more successful results generally, would doubtless be obtained by having at least part of the County Road Committee composed of permanent members, not necessarily members of the County Council.

The system of keeping and paying accounts employed by the Road Superintendent and County Treasurer follows very closely that recommended by this Department.

VICTORIA

The Victoria County Road System, work on which was commenced in 1917, included a large mileage of badly neglected and worn out roads and the county's principal object during the first and second seasons has been to bring the worst portions of the system to a passable condition. To that end, practically all the work during 1918, apart from a limited amount of permanent culvert construction, consisted of preliminary grading, removal of earth shoulders of badly worn roads, opening of ditches, straightening the roadway, widening the grade on a number of sections where the existing width was insufficient for safe travel, and a considerable amount of hill improvement by means of grade reduction and widening of fills. Small quantities of gravel were also applied to preserve the surface of the newly graded road. All work of this character was carefully planned with a view to making it fit into, and reduce the expense of, permanent work which it is hoped may be undertaken in the near future.

The labour shortage during the past three years, general over the entire Province, appeared to be intensified in Victoria County, with the result that the year's programme was necessarily curtailed, but in spite of adverse conditions 12½ miles were graded and 6¼ miles gravelled in the above manner.

WENTWORTH

Practically the entire County Road System in Wentworth County as originally designated has been improved under the Highway Improvement Act. The construction work of 1918 consisted for the most part in improving work formerly done, or the reconstruction of a number of sections whose original construction, by reason of increased traffic, has proved too light.

The year 1918 saw the first operations on a Suburban Area about the city of Hamilton, and some preliminary work was done in preparation for the later construction of more permanent types of road within the area. One of the principal pieces of work done during the season was the resurfacing of a portion of the road between Hamilton and Dundas. The old surface, which had become very flat, rough and rutted, was scarified and reshaped with a grader, and a layer of new stone 16 feet in width and approximately 6 inches thick applied and waterbound. This work was done at a cost of approximately \$4,000 per mile. Subsequent observations showed that this road, although very substantially constructed, could not withstand the disintegrating effects of the very heavy traffic, but will make an excellent base for a bituminous macadam surface to be applied at an early date.

Another piece of substantial construction work was the construction of a concrete gutter 3 feet wide and 270 feet in length with catch basins and culverts, with a view

to providing adequate surface drainage on that part of the Town Line known as the Clappison Mountain. Previous to the season of 1918 water running down the roadside had caused heavy erosion of the ditch and, to some extent, of the road. The ditch was first filled with large stones on which a six-inch layer of concrete was placed and struck off to a circular cross section. Two catch basins with culverts to carry the water across the road were also constructed. This work, which is preparatory to the reconstruction of the road with some durable type of surface, was carried out at a cost of about \$2,900.

Other work of road construction includes a considerable amount of work on the Town Line Road, designated as a Provincial County Road, consisting largely of scarifying the old surface, re-shaping, and the addition of new stone. A number of short sections of waterbound road were also laid at different points on the system.

In general, the roads of this system have been graded to a good width. The increasing demands of traffic are recognized in the county's policy of metalling all main roads to a width of 16 feet, and in the construction of all culverts and small bridges to allow for a roadway of at least 22 feet.

One concrete bridge of 17-foot span and a number of concrete slab culverts were also constructed during the year, noticeable features of which are their generous width as above stated, and an excellent finish which adds greatly to their appearance.

TORONTO, January 8th, 1919.

W. A. McLEAN, ESQ.,
Deputy Minister of Highways, Ontario.

SIR,

I have the honour to submit a brief report on the work carried out on County Roads during the year 1918 in the Counties of Dufferin, Frontenac, Haldimand, Leeds and Grenville, Lincoln, Peel, Welland, Wellington and York, in accordance with the provisions of the Highway Improvement Act.

Throughout the year several special visits were made at the request of the County Councils and the County Road Superintendents, when matters of special importance were being considered. The assistance and advice of the Department in such cases appeared to be very much appreciated by the members of the Councils.

On account of the scarcity of labour very little permanent work, other than the construction of necessary bridges and culverts, was carried out by the above named counties. All available labour, in nearly all cases, was utilized in keeping the roads in a passable condition. This policy will no doubt be continued, pending the return to normal conditions. When more favourable conditions exist, there is no doubt that work of a very extensive nature will be carried out in all counties. In some counties work of the nature of extensive hill cutting and grading, after being well under way, had to be abandoned on account of labour shortage.

There is a tendency in the counties operating under the Highway Improvement Act to construct roads of a more permanent type, the depth, the width, and the type of road surface to be constructed being the chief topic of interest in the road question throughout the Province.

It is very gratifying to report that on many township roads a marked improvement in method of construction is to be noted, following upon a better understanding of the principles of road-making.

Respectfully submitted,

ROBT. C. MUIR.

Assistant Engineer.

DUFFERIN

The County of Dufferin adopted a County Road System in December, 1917. The system comprises 179 miles, or 16.7 per cent. of the total road mileage in the county.

Construction work of 1918 comprises the erection of two cement concrete bridges, one 50-foot span and one 14-foot span, nineteen tile culverts varying in size from 12 to 36-inch diameter, together with road widening and hill cutting in several places.

Corrugated iron pipe culverts were laid in all cases, concrete tile being used only to lengthen existing concrete tile culverts.

Maintenance work consisted chiefly in filling holes and resurfacing with gravel, which work was carried out with the assistance of farm help.

The work on the Provincial County Roads, on which the Government subsidy is 60 per cent., consisted only in resurfacing with gravel in places where required.

The County at the present time has no machinery necessary to carry out extensive construction work.

The County Engineer and Road Superintendent is Mr. U. W. Christie, Orangeville.

FRONTENAC

During 1918, $3\frac{1}{2}$ miles of stone road were constructed and approximately 6 miles of road graded to a width of 24 feet, a large part of the grading being rock cutting. Three concrete slab bridges were constructed, two 10-foot span and one 14-foot span with a 20-foot clear roadway. Numerous concrete tile culverts were laid where required, varying in size from 12 to 24-inch diameter and from 24 to 60 feet in length. In several places the roadway has been widened and straightened and grade reduced, thereby creating a much needed improvement, but much work of this nature has yet to be done. Special attention is now being given to ditching and drainage facilities, which will undoubtedly improve the roads in this county.

Extensive repair work was carried out on many of the most important roads, consisting mostly in resurfacing with crushed limestone. At the present time, there is no systematic method of maintaining the roads, but the Road Superintendent has been endeavouring to impress on the Council the importance of this work, in order that some system may be carried out during the coming year. Trimming along the edges of the stone surface and cutting down the comb that forms along the shoulders, caused by motor cars sweeping loose material to the sides, have been found very beneficial to the stone roads. This allows the surface water to get to the ditches quickly and prevents the surface from becoming rutty. The work is done by the grader, drawn by a steam roller.

The work carried out under the Kingston Suburban Roads Commission consisted chiefly in the erection of two concrete bridges, one 10-foot span and one 14-foot span, as above described, and in ditching and placing concrete pipe culverts and resurfacing with crushed stone where necessary in preparation for more permanent roadway construction. The work was carried out by an organized gang.

Several of the roads under the supervision of the Commission had a surface treatment of tar and sand, all depressions being first filled with a mixture of tar and stone chippings and well tamped into place. The cost of this work was approximately \$600.00 per mile for a width of 12 feet. This class of work has been found very satisfactory.

During the latter part of the year the Provincial Government took over eight miles of road within the Suburban Area as a Provincial Highway, which has reduced the mileage of roads under the Commission to 52 miles. The majority of the roads under the Commission bear heavy and fast traffic, and to meet these demands a more permanent type of surfacing is contemplated by the Commission in the near future.

During the year a small concrete mixer was purchased at a cost of \$306.00 by the County to carry out the work of erecting concrete culverts and small bridges. All of this work is done by day labour and is very satisfactory.

The County Road Superintendent is Mr. R. H. Fair, Kingston.

HALDIMAND

An extensive programme of grading work was carried out during the year by the County. Approximately 80 miles of road were graded to a width of 24 feet, at an average cost of \$100.00 per mile. Eight outfits were employed on the work, 10 miles to each outfit. The work was done by the use of tractors, two belonging to the County and six rented at a cost of \$1.50 per hour, exclusive of fuel. Throughout this 80 miles of road, a large number of culvert tile culverts, varying in size from 12 to 24 inch diameter and from 16 to 28 feet in length, were placed where required across the road and at farm entrances. A few corrugated iron pipe culverts were also used. On the whole, this work was very satisfactory, and was carried out in view of preparing for the laying of waterbound macadam roads during the coming season. The work was chiefly carried out in a very heavy clay subsoil.

While the majority of the clay roads were kept in a fair state of repair by dragging, a few of the existing stone roads were resurfaced for approximately five miles in length. On one road, with a haul of eight miles, a steam tractor hauling a train of six dump cars, each with a capacity of $3\frac{1}{2}$ cubic yards, was used to convey the crushed stone from the quarry to the road. Approximately two miles of stone road were given a surface treatment of tar and stone chippings, the depressions being first filled with tar and stone chippings. The quarries belonging to the County were not in operation during the year, but it is hoped, now that the war is over and labour more plentiful, that these will be working during 1919, when an extensive road surfacing programme is to be carried out according to plan.

Speed sign posts have been erected by the County at seven points along the roads.

The County Road Superintendent is Mr. D. W. McBurney, Hagersville.

LEEDS AND GRENVILLE

During the year several important extensions of the system were approved, thereby connecting up the system and providing greater continuity. There are, however, still many disconnected links which must be added before the county can have a well balanced County Road System. With these extensions, the road mileage under the system is now 322 miles, which is approximately 18 per cent. of the total road mileage in the County.

The Brockville-Prescott Toll Road was purchased in 1917 by the County at a cost of \$9,000.00. Five and one-half miles of stone road, 9 feet wide, were constructed and seven miles graded to a width of 24 feet. Nine concrete box culverts varying in size from 3 to 10-foot span, were built and also numerous pipe culverts laid. Resurfacing with broken stone was carried out on many of the existing stone roads.

Much work in the nature of widening, straightening the road and reducing grades has been carried out, the grades in several places being reduced from 14 to 6 per cent. A great deal of contemplated work in this county was, however, incomplete, owing to scarcity of labour.

Maintenance, as carried out not only in this county, but in the majority of other counties, is not satisfactory; a more systematic method of carrying out repairs is



HILL-CUTTING THROUGH ROCK IN LINCOLN COUNTY.

The grade is being reduced, and the excavated stone crushed for use in the road surface.

absolutely necessary. In those counties where stone is easily obtained, it should be crushed and placed in piles at intervals along the road-side so that a patrolman can apply the stone when and where required. On the completion of new stone roads, a surplus of stone is always desirable, and this can be piled along the road-side ready for future repairs.

The County Engineer and Road Superintendent is Mr. E. R. Blackwell, Brockville.

LINCOLN

During the latter part of the year the Provincial Government took over that part of the Queenston and Grimsby Stone Road within the county as a Provincial Highway. This road, extending across the county from the American frontier, carries an exceedingly heavy and fast foreign traffic. It was the first road designated by the County as a County Road under the Highway Improvement Act, 1904. The Government in acquiring this road as a main highway relieves the County of a large annual expenditure, approximately \$36,000.00 being expended by the County during the past year.

In 1918, extensive grading was carried on as in 1917, approximately 53 miles of road being graded to a width of 24 feet to 28 feet. Lincoln County has paid special attention to this class of work since extending the system in 1916. The majority of the roads when taken over were narrow and in an unimproved condition. This work includes the reducing of grades, widening and straightening the road. A gasoline tractor is used in hauling the grader in breaking up the earth and finishing to proper grade, the earth being first turned over with a plough. For grade reduction in earth, slush scrapers are used in short hauls and wheel scrapers in longer hauls. This work is very creditable to the County, and might be copied by other counties with advantage. The elimination of dangerous curves and the reduction of grades are essential to all county roads.

In addition to the above-mentioned grading, one mile of tar penetration macadam and two and one-half miles of gravel roads were constructed during the year. The gravel was used on sand roads, which were impossible to compact. With the addition of the gravel a good and well compacted surface has resulted. Fourteen concrete box culverts, varying in size from 3 to 10-foot span were built; also a large number of pipe culverts laid, ranging in size from 12 to 24-inch diameter. Corrugated iron pipe culverts were used throughout the work. Wherever a pipe culvert is required at farm entrances, the County bears the entire cost of putting the same in place.

On one road where the work of reducing the grade was in rock, the stone taken out was put through the crusher located close by, and placed on another section of the road.

The county now owns an extensive plant, all work being carried out by day labour. A gasoline tractor 16-32 h.p., similar to the one already in use, was purchased at a cost of \$2,630; a stone crusher complete, 100 cubic yards capacity per day, at a cost of \$3,500; a one-ton Ford truck, \$845; a horse-drawn broom, \$300; these together with a large number of scrapers, ploughs, graders, etc., were the chief units of machinery purchased during the year. The Ford truck is used chiefly for conveying small quantities of materials to the work where required and is found very useful.

With a view towards carrying out extensive surfacing during the coming season, a stone quarry in the vicinity of Smithville, $5\frac{1}{4}$ acres in extent, was purchased by the county at a cost of \$600.00.

The townships within the county are doing very creditable work under the present labour conditions; this is very noticeable in the back townships, where, prior to the county extending its system in 1916, very little work was carried out. The work is chiefly grading and gravelling. The tendency in these townships is to widen the grade to 24 feet.

During the coming season, it is the intention of the council to construct a large mileage of tar penetration macadam roads; 16 feet in width. The council has adopted a standard width of 16 feet of metal surface for all County Roads.

No work was done on the roads under the St. Catharines Suburban Road Commission in the past year.

The County Road Superintendent is Mr. Peter Robertson, Beamsville.

PEEL

Construction work has been greatly retarded in this county during the past year owing to the scarcity of labour. The majority of the work started throughout the year was left incomplete. The construction work consisted chiefly in cutting down grades, widening and straightening the road, laying a substantial sub-base of gravel. A large number of corrugated iron and pipe culverts were placed across the road and at farm entrances, where required. In the case of tile culverts at farm entrances, the whole cost is borne by the county.

The work on the Provincial County Roads consisted in some places in scarifying the existing stone surface, adding fresh stone and consolidating the whole. At one place the grade was reduced from 9 to 6 per cent. and widened to 28 feet between ditches. Numerous pipe culverts were laid across the road.

During 1918, the County Road System was extended from 127 to 140 miles, being approximately 16 per cent. of the total road mileage in the county. Approximately eight miles of road designated in the past year are on the county boundary and half the cost of the upkeep of such will be borne by the adjoining county.

On the return to normal conditions this county contemplates pursuing an extensive programme of work on its Provincial County Roads.

The County Engineer and Road Superintendent is Mr. C. R. Wheelock, Orangeville.

WELLAND

During the past year, twenty-four miles of road were added to the system, making a total length of 184 miles, or approximately 16 per cent. of the total road mileage.

The construction work throughout the year consisted chiefly in building a large number of box culverts, varying in size from 3 to 6 foot span, and the building of approximately three miles of water-bound macadam road. Numerous concrete tile culverts were laid across the road and at farm entrances. Approximately eight miles of stone road were re-surfaced with crushed stone three inches in depth. During the year, the three outfits were constantly employed on the roads, either in construction or repair work, with the result that a large mileage of roads were lightly re-surfaced and put into good shape. Throughout the year a large mileage of road was given a light surface treatment of bituminous material and sand. In some places tar was used, in others a light asphaltic oil. The results obtained from this experiment proved that the light tar was more satisfactory than the oil. In view of such variations in asphaltic oils, it might be desirable for the counties intending to use the same to have the oil tested at the Department's laboratory before use in the road. Otherwise it will be



INSUFFICIENT DRAINAGE.

Showing the effect of water and frost on an insufficiently drained macadam road.

a difficult matter for the Superintendent to know whether he has obtained a 40 per cent. asphaltic oil or not.

Several units of machinery were purchased during the year. These were: a 3-ton motor truck at a cost of \$4,875.00; an oil heater and pressure distributor, 500 gallons capacity, at a cost of \$1,055.00; a horse-drawn sweeper, \$490. The oil distributor was found to be very satisfactory in every way. The motor truck, which was used for hauling stone from the quarry to the road, was not satisfactory, being in the repair shop most of the time. On work of any great extent, one truck is not sufficient if good results are to be obtained; three trucks at least should be employed on hauls up to ten miles.

A large shed, together with the land, was purchased by the county for the purpose of storing machinery during the winter months. The lot, approximately 100 feet square, was purchased for \$1,510.00 and is located in the City of Welland, a central point in the county.

Speed sign posts were erected by the county during the year on several of the main roads.

The County Superintendent is Mr. W. W. Brookfield, Welland.

WELLINGTON

Permanent work during the past year consisted chiefly in building concrete bridges and culverts, and the laying of numerous tile culverts. Ten bridges, varying in span from 12 to 80-foot and six culverts of 3 to 10-foot span were built. Concrete tile and corrugated iron pipe culverts were placed where required. These varied in size from 12 to 36-inch diameter. No concrete tile are used over 18-inch diameter, as these have been found to be unsatisfactory. With respect to tile culverts at farm entrances, the county pays for the tile and the farmer hauls them from the factory and lays them in place.

The Irwin Bridge was the most important work carried out during the year. This bridge replaced an old timber structure. The type of bridge constructed is an overhead concrete arch truss of 80-foot span. It is built to conform with the Department's specifications for a Class "C" bridge, having a 20-foot clear roadway. It was the first bridge of this type to be constructed in the Province of a span of 75-foot or more. The cost of this bridge was approximately \$10,300.00. Numerous smaller spans of this type of bridge have been constructed throughout the county, and are found to be very satisfactory. The county has paid particular attention to the bridges, and a large sum of money has been expended annually in erecting bridges and culverts, with the result that at this date, the county can go ahead and construct a large mileage of roads without being inconvenienced with the building of bridges.

Work of the nature of widening and raising the road was carried on at several places. At one particular place, a fill of approximately twenty-one feet was necessary in widening the road through a swamp, brush, field-stone and gravel being added from time to time, as it was found that as soon as the dead load was put on the existing road-bed the fill settled. On a length of 1,200 feet, approximately \$2,700.00 was expended at this spot, and it is doubtful yet whether a stable road-bed has been obtained.

On several sections of road, varying in length from 600 to 2,000 feet, a surface treatment of tar and sand was applied. This work was not the nature of the usual carpet coat, but was an endeavour to build up a worn-out macadam road with the aid of tar and pea gravel. A part of this work had the writer's personal supervision, and the method of procedure was briefly as follows: The road surface was thoroughly cleaned and hot tar then applied at the rate of one-half gallon to the square yard. This was then covered with sand. On these sections of road, the stones in the surface projected about one-half inch; this carried the traffic and prevented the thick mat of tar and sand from being picked up. In the places where a second treatment of tar and sand was applied, a smooth and compacted surface has resulted. This work is very satisfactory and the method might be adopted in other places, where the county does not wish to bear the expense of re-surfacing with a heavy coat of stone. On two places, where the large stones in the road were very prominent, it was found that a coat of gravel applied was soon swept away by the traffic and weather. The road at these points was composed of very hard flinty rock. Here it was necessary to apply tar at the rate of three-quarters of a gallon to the square yard; this was covered with 2½ inches of gravel. It is interesting to know that, though a part of the gravel was swept away, a smoother surface than formerly has resulted.

The work under the supervision of the Guelph Suburban Roads Commission was chiefly shaping the road and re-surfacing with gravel in places, together with the laying of pipe culverts. It is the intention of this Commission to purchase at an early date an outfit of its own to carry on the work. In the vicinity of Guelph it is very difficult to obtain teams and labour.

The chief items of machinery purchased by the county during the year were a tar kettle of two-barrel capacity at a cost of \$212.00 and a horse-drawn sweeper at a cost of \$444.00.

The County Road Superintendent is Mr. John M. Young, Harriston.

YORK

During the year, four different types of surfacing were laid, these being water-bound macadam, tar penetration, asphaltic concrete and cement concrete. Asphaltic concrete and cement concrete surfaces were laid on sections of road near the limits of the City of Toronto, these roads carrying a traffic almost equal to city traffic. Asphaltic concrete surface, two inches thick, was placed on a well-consolidated crushed stone base, 8 inches thick, for a width of 22 feet. Approximately eight-tenths of a mile of this surfacing were laid. Reinforced cement concrete surfacing, 8 inches thick and 22 feet wide, was laid on the Weston Road, from the limits of the City of Toronto, northerly 1,300 feet. On upper Yonge street, in the vicinity of Aurora and Newmarket, 2.6 miles of tar penetration surfacing, 18 feet wide, were laid on a 5-inch crushed stone base. On several roads, approximately five miles of water-bound macadam surface, varying in

width from 7 to 24 feet, were constructed. Approximately one mile of crushed stone base, 6 inches thick, was laid in preparation for a tar penetration surface and six and one-half miles of road graded to a width of 27 feet.

At several places, work of extensive hill cutting, widening and straightening the road was carried out. In places the grade was reduced from 12 to 5 per cent.

Four concrete bridges of spans from 10 to 15-foot and thirty-five concrete box culverts, 4 to 8-foot span, were constructed, together with a large number of pipe culverts with concrete end walls.

A large mileage of stone road was given a surface treatment of tar and sand.

With the exception of two one-ton second-hand Ford trucks at a cost of \$350.00 each, no new machinery was purchased during the year. The majority of the work in this county is carried out by contract.

The Engineer to the Toronto and York Roads Commission is Mr. E. A. James, Toronto.

TORONTO, January 30th, 1919.

W. A. McLEAN, Esq.,

Deputy Minister of Highways, Ontario.

SIR,—

I have the honour to submit a report of the work performed on the county roads of Essex, Kent, Lambton, Norfolk, Waterloo, Hastings, Prince Edward, Lennox and Addington and Renfrew, during the season of 1918.

As you are aware, the necessity of successfully prosecuting the war had resulted in stripping the country of all available sources of surplus labour; consequently all road work was necessarily much restricted, only construction work of an imperative nature, such as replacing worn out culverts and bridges, being undertaken, and in addition whatever maintenance work could be done during the farmers' slack periods.

Respectfully submitted,

ARTHUR SEDGWICK.

Assistant Engineer.

ESSEX

The same work commenced in 1916 was continued during 1918. Old timber culverts over the municipal drains are being replaced by concrete structures with roadways about 22 feet wide. In addition, two bridges of 90 and 50 feet span were constructed at a cost of \$10,912.73.

The feature of the work in this county is the system of maintaining the clay roads, which comprise the major portion of the county's mileage, by the consistent use of the "split-log drag," or its modern modification built entirely of steel. Under the statute labour system, the roads were usually "scraped" once or twice in the early spring with road graders provided by the townships. Nothing further was done in this respect during the later spring and summer months; consequently the beneficial results secured in the spring only lasted until the next rainfall and these clay roads usually continued in a rough, rutty condition for the balance of the year. Now, under the County Road System, this has all been changed and traffic conditions on these clay roads have been vastly improved. A proper patrol system has been established and each stretch of road from two to four miles in length is put in charge of a foreman whose chief business at present is dragging the road after every rainfall.

While it must be admitted that clay roads are very disagreeable and unsatisfactory to use in wet weather, yet by keeping the roadway crowned and smooth in dry weather more water is shed off the road so that the mud does not get so deep and dries up more quickly than it otherwise would. The secret, of course, is in getting men who will take both the time and interest to insure the road being dragged after every rain, otherwise there will be only dissatisfaction on the part of the travelling public.

One hundred and forty-two miles of road were dragged at a total cost of \$4,863.39, or \$34.25 per mile.

KENT

Kent County has been operating under the Highway Improvement Act for two years. In the north and west of the county, conditions are much the same as in North Essex and the work carried on here is similar to that outlined in Essex. Numerous concrete culverts and short bridges have been built and a patrol system established for dragging and other maintenance work. Three hundred and thirty miles of road were kept dragged during the season at an average cost of \$40.50 per mile. Several gravel pits have been purchased, convenient to the roads in the southeastern part of the

county, which will be used for construction and re-surfacing in the future when the conditions of the labour market are more favourable.

Some seven thousand dollars was spent in re-surfacing, mostly of a light nature, wherever it was possible to get it done.

The winter of 1917-1918 being exceptionally severe, it was necessary to spend some money both in Essex and Kent for snow removal. This expenditure has been of very rare occurrence in these southern counties.

LAMBTON

This was the first year for Lambton County to operate under the Act. As soon as the Superintendent was appointed, steps were taken to secure a proper organization for the systematic dragging of the clay roads. The results obtained were gratifying, but taking the system as a whole, including some mileage of sand roads, the money spent for grading and dragging averaged only some \$17.00 per mile. This no doubt will be exceeded next year when a full organization working for the full year is secured.

Bridges and culverts comprised the more important construction work, about \$20,000 being expended thereon. In addition, a mile of new road was opened up, graded and gravelled adjoining the city limits of Sarnia, and giving a more direct outlet to what is known as the Lake Road.



A GRAVEL ROAD IN LAMBTON COUNTY.

When one surveys the conditions which have prevailed in these three counties in the past and compares them with what is and can be done under the Highway Improvement Act, one must be impressed with the benefits to be derived therefrom.

A conservative estimate of the amount of statute labour spent on these roads in the past might be taken as \$100.00 per mile per year. Against this we have a maximum of \$40.00 per mile for maintenance under the Act, or about \$32.00 for the county's share with vastly improved results. The balance of \$100.00 with the 40 per cent. grant from the Government will provide an additional \$100.00 per year for permanent construction work.

With the return of normal conditions resulting from the termination of the war, and with increased funds not beyond the ability of the farmer to pay, surely brighter prospects are ahead for those who have so long accustomed themselves to being "stuck in the mud."

NORFOLK

This was also the first year for Norfolk to operate. Conditions here vary greatly, varying from stiff clay to deep sand. Until they can be gravelled or macadamized, little can be done to improve the sand roads. A large proportion of the gravel and clay roads were improved by cutting off the shoulders and in some cases a system of dragging was commenced. In such a county, where clay roads are the exception instead of the rule, it was not to be expected that the "dragging" would become the general practice as readily as in the counties previously mentioned. A little re-surfacing work

was done on the Provincial County Roads and some eleven thousand dollars spent on bridge and culvert construction.

As there are no large amounts of local material easily accessible to the county roads, very little actual road construction could be done while the war lasted. The county has, therefore, very wisely confined itself to making such preparations as it conveniently could towards the time when road building of a systematic and continuous nature could be undertaken.

HASTINGS

The work in this county for some years has consisted of the re-surfacing and cutting off of shoulders of old gravel roads constructed years ago as a county system. This system was established about sixty years ago before the country was properly served by railroads. At that time it will readily be appreciated that such roads would be most important factors in the economic life of the country and we may safely assume that they were built and maintained with all the enthusiasm and energy that their importance demanded. With the ushering in of the railroad era, whereby shipping points were brought reasonably close to the farmer, the traffic on the county highways diminished in volume and assumed a purely local character. Under such conditions it was a simple and inexpensive matter to maintain these roads in a manner suitable to the needs of local horse-drawn traffic. The roads, however, were retained under county control and maintained as a county charge, not that the county, as a whole, was vitally interested in the respective roads, but simply because such a system had become established. The roads being easy to maintain and not a serious financial burden on the ratepayers, we can picture to ourselves the County Council merely setting aside a nominal sum each year for the maintenance thereof.

Then came the time, about 1908, when all the old wooden county bridges, having served their natural life, began to fail at an alarming rate. An annual levy was no longer equal to the burden of replacing them as fast as needed and the county had to commit itself to a large debenture debt for this purpose. One can readily understand then that what little public interest in road-building that formerly existed was diverted to what became the burning question of county bridge construction. The interest and sinking fund charges on these debentures became an important part of the county taxes.

About this time the automobile began to make itself felt in the county, very unobtrusively at first, but soon in such numbers as to become a serious factor in the cost of road maintenance. Commodity and labour costs were mounting steadily and the roads began to depreciate noticeably, especially in the south, but no appreciably increased appropriation was made for maintenance. We might safely assume that the roads had largely deteriorated before the County Councils had recognized that greater efforts and expenditures were required to meet the changed conditions that had arisen.

Then came the war which multiplied the traffic on the roads and inflated prices so that a dollar for maintenance would only go half as far as before. The destruction of the roads in the southern portion of the county, with its denser population and traffic, has been most noticeable during the last three or four years. On the main roads, bearing the heaviest traffic, the destruction has become so complete that the problem has resolved itself from road maintenance to one of reconstruction.

To meet this problem, the County Council during the coming years must recognize that greater efforts and different methods will be required in the south from those in the north with its sparser population and vastly lighter traffic.

There was spent on grading and re-surfacing during the season of 1918 some \$40,000. It is noticeable that bridge building costs have gradually dropped during the last seven years until they are now almost negligible.

WATERLOO

This county has been operating under the Act for a number of years. In the central and southern portions, in which are situated the prosperous cities and towns, the denser traffic conditions have created a demand which has been met by an energetic and quite progressive road-building programme. In the outlying portions of the county, however, the roads have not been maintained or improved in a manner which the availability of road-building material and the prosperous character of the countryside would suggest. A considerable amount of money is spent for re-surfacing the roads in these parts, but there seems to be little demand for a proper maintenance system and the grading and gravelling in many instances have not been finished in the manner required by modern traffic conditions.

The organization in this county is established on strictly township lines, all work, however, being under the control of a Superintendent appointed by the County Council. This is regrettable, as the traffic existing on most of the roads by no means originates

solely from within the municipality in which the respective roads are situated. This necessarily has resulted in a disproportionate neglect which the collective interests of the county at large does not warrant.

A re-designation of the county roads is required, as in some cases the roads already assumed are not those carrying the heaviest traffic. Needless to say, however, the demand for the amelioration of the conditions must necessarily first come from within the county itself.

As already stated, in the townships surrounding the urban centres a better feeling apparently exists and some attempt is being made to keep pace with the ever-increasing traffic demands. The use of Tarvia for re-surfacing is being resorted to more and more on the roads leading out of Kitchener, Galt and Preston.

PRINCE EDWARD

The work in this county last year has consisted chiefly of re-surfacing the stone roads constructed some years ago. The limestone road used in Prince Edward has a tendency towards shaliness and therefore soon wears into ruts and depressions. The rock being soft, new material is easily bonded into place with the roller, usually without the necessity of picking up or scarifying the old surface.

Closer in towards Picton, where traffic and the consequent wear have been heavier, re-surfacing of a more substantial nature has been done.



RENFREW COUNTY ROAD WORK.

Hill-cutting through rock, and widening an existing stone road.

Some grading has been done on the Provincial County Road leading from Picton to the Northumberland boundary. The quarter mile link at the old Carrying Place between Northumberland and Prince Edward has been graded and straightened.

A grant of \$1,402.51 was made to the Town of Picton for draining and macadamizing.

LENNOX AND ADDINGTON

In this county, as in most of the earlier counties to operate under the Act, last year's activities were restricted to keeping the roads in a reasonable state of repair during the war. With the depreciating value of the dollar, increasing scarcity of labour supply and increased usage of the roads all caused by the war, the results obtained have not in every case kept pace with the requirements. Deducting some three thousand dollars for special grants, the amount for construction and maintenance on the County Road System, comprising about one hundred and seventy miles, was \$18,053.43, being an average of about \$106.00 per mile. With the present high prices this amount is not sufficient to take care of the ordinary annual wear and tear on the roads and, as in the neighbouring counties, the coming of peace will require a re-awakened road-building campaign in order that the result from earlier construction be not lost entirely.

RENFREW

This was the first year for Renfrew to operate under the Act. Renfrew County was one of the later counties to be cleared and settled and consequently there is great scope for road-building enterprise. It was not expected that much more than organization work would be accomplished the first year. A start, however, was made on replacing old wooden bridges and culverts, hundreds of which are in existence and are rapidly becoming a menace to the travelling public. In addition about six miles of grading was done and some re-surfacing also. Nearly eleven thousand dollars was spent on bridge and culvert construction and grading, and between eight and nine thousand on maintenance, chiefly re-surfacing and bridge and culvert repairs.

TORONTO, January 15th, 1919.

W. A. McLEAN, Esq.,

Deputy Minister of Highways, Ontario.

SIR,—

I have the honour to submit a summary report on the improvement of the county roads in the Counties of Prescott and Russell, Carleton, Ontario, Simcoe, Halton, Perth, Oxford, Middlesex, Huron, and Northumberland and Durham, for the year 1918, according to the provisions of the Highway Improvement Act.

In addition to the regular Departmental inspection, a number of special visits were made during 1918 at the request of the County Road Superintendents.

During the year labour and financial conditions had the tendency to decrease the amount of construction throughout the various counties, but preparations have been made to embark on an extensive programme of road improvement in the period of reconstruction in the above mentioned counties.

Visits were also made to the various township municipalities in the above mentioned counties where a Township Road Overseer was appointed.

The various County Councils at times requested the assistance and advice of the Department, as well as various Township Councils and Suburban Area Commissions.

All of which is respectfully submitted.

J. A. P. MARSHALL,

Assistant Engineer.

PRESCOTT AND RUSSELL

The expenditure during 1918 was mainly on the construction of bridges. In accordance with a resolution passed at the January meeting of the County Council, the road machinery outfits were not operated during the year, except No. 1 outfit at St. Isidore Village. This outfit was rented to the Council of the United Counties of Stormont, Dundas and Glengarry.

One of the most important features in the development of the County Road System was the adoption of Road No. 1, formerly known as the Montreal and Ottawa Road, as a Provincial County Road.

Great difficulty was experienced in securing labour for road work during the year on account of war conditions. So acute was this situation that it was impossible to secure men or teams in many cases to undertake ordinary repair work at the proper time.

Among the more important of bridges constructed and completed during 1918 were the following:

(1) Lapointe Bridge over the Nation River, consisting of three spans, two of 40 feet each and one of 224 feet, at a total cost of \$56,843.45. The importance of the road which this bridge connects can be readily seen by the increasing number of vehicles using the road since its erection.

(2) Emard Bridge over the Castor River, consisting of two spans of 65 feet, built of steel and concrete at a cost of \$19,933.77.

(3) Lavallee Bridge, Brown's Bridge, two Gullet Bridges in South Plantagenet, Beckett's Bridge and Bear Brook Bridge.

The question of the change in the site of the Bear Brook Bridge was brought before the County Council in January. After an examination of the locality by the Committee on County Roads, it was decided that the new bridge should be built in the proper road allowance, a distance of about 400 feet east of the old structure. This necessitated the construction of new approaches and had the effect of straightening the road, thus improving the general appearance of the bridge and road in that locality.

The approaches were constructed at the price of thirty-five cents per cubic yard and are now nearly completed.

Prescott and Russell expect to undertake a comprehensive and extensive programme of road construction in the very near future and their efforts during the past few years have been with that in view.

The County Road Superintendent is Mr. F. A. Senecal, Plantagenet.

South Plantagenet and Russell Townships.

Visits were also made to the Townships of South Plantagenet and Russell where Township Road Overseers have been appointed.

South Plantagenet during the last year expended approximately \$8,000.00 and the Township Road Overseer is Mr. E. Parent. The organization of the township system here in particular is worthy of emulation. The Township is divided up into sections, each in charge of a foreman who is responsible for his particular section. The pay sheets are made up and sent to the Township Road Overseer, who classifies the work and after certifying to the correctness, the accounts are passed by the Township Council. As the roads of South Plantagenet are chiefly clay, dragging with the split-log drag, has been the chief work along with the construction of a number of township bridges.

Russell Township work is very similar to that of South Plantagenet. The Township Road Overseer is Mr. E. Brisson of St. Onge.

CARLETON

The past year has been very unfavourable for road construction and only fair progress was made on the County Road System in Carleton County. The great drawback was the scarcity of labour during the season. On account of the many short sections of road constructed throughout the different municipalities, there was much moving of machinery, men and teams.

Two large bridges were built during the season:

(1) Galetta Bridge over the Mississippi River in Fitzroy Township. The superstructure consists of two Warren trusses of 57' 4" span centre to centre of bearing, carrying a 16-foot reinforced floor. The substructure consists of two abutments with displayed wing walls of about 12 feet in length and one central pier; total cost \$10,856.00.

(2) Mud Creek Bridge over Mud Creek in Gloucester Township, consisting of a deck bridge of one central span of 50 feet, and two outside girder spans of 41' 6" with an 18-foot concrete roadway; total cost of bridge \$14,187.00.

A number of short sections of gravelling were undertaken besides other stretches of preliminary grading and tile draining.

The maintenance work on the County Road System has not been systematically carried out, but steps have been taken to remedy this and we look for greater improvement in this matter.

The county, during the season of 1918, spent \$14,288.28 on new machinery, which consists of two stone crushers, one oil tractor 27-50 h.p., one oil tractor 17-34 h.p., two graders and two oil tanks.

On the Stittsville Road, County Road No. 10, in concession XII, lot 23, the right-of-way was straightened, cleared, and the roadbed straightened. Previously this was a narrow crooked winding road. The distance improved was one-half mile and the total cost approximately \$525.00.

During the year two additions were made to the County Road System under by-laws 635 and 649.

(1) A connecting link was connected south of Vernon with Provincial County Road No. 26 in Stormont, Dundas and Glengarry.

(2) Carp Road, portion of forced road, Carp to South March.

The average cost of finished roadway in Carleton County during the season of 1918 has been approximately \$2,400 per mile, including grading.

Nepean Township.

Nepean Township was visited during the summer of 1918. The Township Road Superintendent is Mr. W. Smith of Westboro. During 1918 considerable work was undertaken and the year's expenditure was approximately \$15,000.00 for work on the township roads. The Township is well supplied with road machinery and contemplates an extensive programme of road construction.

ONTARIO

The County of Ontario adopted a system of County Roads in 1917. However, it was not until March, 1918, that a superintendent was appointed. The system as originally designated comprised 247 miles, which is approximately 15.6 per cent. of the total road mileage within the area covered by the County Road System.

The system for the most part consists of old gravelled roads which have become neglected. The County of Ontario is hilly in the northerly part of the Townships of Pickering and Whitby, level in the Townships of Thorah and Mara, and the remainder might be considered as of a rolling nature. The south end of the county is greatly cut up by small rivers and creeks which find their source along the height of land in the extreme north of Pickering and Whitby Townships. These rivers flow south into Lake Ontario, and therefore necessitate the building of many culverts and bridges, more especially along the roads running easterly and westerly, thereby incurring great expense when the cost of road-building is considered.

In August, 1917, the Kingston Road, originally designated as County Road No. 1, was taken over by the Department of Public Highways as a Provincial Highway. This comprises 16 miles.

The method of keeping the accounts and paying the men as suggested by this Department has been adopted. During 1918 an advisory committee was appointed, consisting of five members, to meet at the call of the chairman.

With regard to road material, gravel seems to be fairly plentiful, but of rather inferior quality and care should be taken in applying it. During the season of 1918 on parts of the County Road System gravel was dumped without any further attention. This is poor practice.

At the present time, preliminary grading and draining should be done as many of the present county roads are in need of ditching and tile draining.

The machinery purchased by the county during the season consisted of one kerosene tractor, one oil truck, four graders, four pick plows, eleven bowl shovels and fifty-four road drags, besides other small articles.

On Road No. 16, lot 12, Brock Township, a bridge was built consisting of concrete abutments and steel superstructure. The span was 28 feet clear. The total cost was \$2,275.35.

In Pickering Township on County Road No. 3, three small concrete culverts were built, two of six-foot span and one of seven-foot span.

In the Township of East Whitby from Cedar Dale south from the Base Line to the Lake on County Road No. 2, considerable grading and filling were done. This road was previously much in need of repair, owing to heavy traffic. Approximately \$800.00 was spent on 1.8 miles of road. A big improvement was noted here on completion of the above work.

Considerable grading and gravelling were done on the Centre Road, County Road No. 6, north from Gamebridge, but this work will need attention the first thing in the spring.

Hill cutting was done on Scugog Island on County Road No. 14. This work cost \$280.07 and a great improvement is noted.

Some crushed stone was placed on County Road No. 18 north of Atherley for a distance of half a mile. Some binder should be put on and the whole work consolidated by a roller.

A considerable amount of finishing up will have to be done on the uncompleted work of 1918.

SIMCOE

Simcoe County has the second largest mileage of county roads in any one county in the Province.

Very little construction work was undertaken on the county roads in 1918. A number of small culverts were constructed on those portions of county roads where no other construction work was undertaken.

A substantial piece of construction work was done in the Town of Barrie, under a special grant, on Steele Street.

On Road No. 7, Adjala Township, Lot 25, a concrete and steel bridge was built of 75-foot span with a 16-foot roadway, costing \$7,901.32.

On Road No. 11b, the substructure was completed for a 60-foot span bridge at Deadman's Bridge and steel was delivered on the ground, but owing to the lateness of the season the erection was left over until 1919.

The Shannon Bridge at the intersection of Raglan, Hume and St. Clair Streets in the Town of Collingwood, consisting of a 40-foot concrete arch, was built at a cost of \$4,678.58. This was provided for by a special grant to the Town of Collingwood.

During 1918 that portion of the Penetang Road running north from Waverley to Penetang was assumed as a county road.

One of the most important features in the development of the County Road System was the designation and approval of three important county roads as Provincial County Highways during 1918. These were (1) the Bradford-Barrie portion of the Penetang Road, (2) the Barrie-Orillia Road to the Severn Bridge at the north-western boundary of Simcoe County, (3) the Barrie-Angus-Brentwood-Sunnidale.

northerly along the Shore Road to Collingwood. The total mileage of these Provincial County Roads as designated comprises 85 miles in Simcoe County.

The machinery equipment is inadequate for the needs of such a large county as Simcoe County. Although in recent years the policy has been the construction of bridges and culverts and road maintenance, it would appear necessary before any large programme of construction is undertaken on the county system that suitable machinery equipment be purchased. At the present time the county does not own a steam roller.

A considerable number of culverts were constructed during 1918; in all, 25 culverts, 2 bridges and approximately 1 mile of gravelling.



PERMANENT MATERIAL BUT DEFECTIVE DESIGN.

Deeper foundations to a firm bearing, and heavier walls are needed by many concrete structures.

HALTON

Owing to war conditions, Halton County did not undertake very much work on County Road System during the season of 1918. A great deal of difficulty was found in getting the necessary labour and teams on the road at suitable times.

On County Road No. 2, Trafalgar Township, Concession 2, N.D.S., one and one-eighth miles of macadam road were built at a cost of \$5,110.48. This completes the construction of the county road between Bronte and Milton.

Work was also undertaken on the Tansley Bridge during the season. This bridge not completed.

On the Lake Shore Road, the Bronte Bridge was built by the Toronto and Hamilton Highway Commission and the county's share here amounted to \$12,092.96.

A number of small culverts, cement, tile and corrugated pipe were constructed on portions of county roads where no other construction work was undertaken.

Proper, adequate and systematic maintenance will help the present roads in Halton to a large degree. In comparison with some of the other counties, the roadway in Halton is narrow.

On Road No. 3 (Brant Street) just north of Burlington, a retaining wall was constructed where a ditch was making serious inroad on the travelled portion of this county road.

On County Road No. 8 (Milton Line) one-half mile of stone road was built at a cost of \$1,332.33. In addition to this work, five corrugated pipe culverts and one concrete culvert were built.

PERTH

During the season of 1918 very little in the nature of road construction was undertaken on the County Road System of Perth County.

The chief work done in the towns and villages was the improvement of Main Street in the town of Mitchell, which consisted of 1,000 feet of macadam roadway, a continuation easterly of the 1916 and 1917 work.

This road was drained on both sides from St. Davids Street easterly for a distance of 1,015 feet, with 5-inch and 12-inch tile and macadamized for a width of 16 feet in the same manner as work done in previous years, costing as follows:

175 feet 12-inch tile	\$56 71
2,000 feet 5-inch tile	90 00
Putting in tile and covering	241 15
Canada Crushed Stone Co., 591 tons	484 86
Freight	602 30
Teaming	197 30
Field stone at \$4.50 per cord	80 14
Spreading and shovelling at \$2.50 to \$3.50 per day	167 28
Rolling	190 25
9.4 tons coal for roller	92 00
Tarvia	41 10
Lighting	14 50
Advertising	16 00

Total cost	\$2,273 59
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Price per square yard, approximately, \$1.26.

On Road No. 19, the Huron Road, from opposite Lot 22 in the Township of Logan west to Dublin was in very bad condition and very little money had been spent on it under the County Road System since its adoption. As a consequence, the gravel in many places had almost disappeared, and it was intended to put it in shape and metal the entire distance, but only half was completed, beginning at the two extreme ends, that is, at Dublin and working easterly and at Lot 22 and continuing westerly.

On Road No. 33 the work consisted of metalling with crushed gravel from Russell-dale westerly to Lot 28, about 2 miles, costing as follows:

Metal, 2,786 yards at \$1.10 to .60 per yard	\$2,151 19
Gravel	480 60
Spreading, shovelling	187 00
Draining opposite Lot 16, 463 ft. 4-inch tile	38 90

Total cost	\$2,857 69
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Considerable drainage work has been undertaken during the year. A number of culverts have been built also.

There is a tendency in parts of the county to heap the crushed gravel up on the surface of the road, thereby inconveniencing the traffic passing over it and at the same time cutting the sides. In this way it takes some time before it is consolidated.

The following is a summary of the work done in 1918 on the County Road System of Perth:

Grading.....	3.75 miles
Stone roads.....	1.18 miles
Gravel roads.....	4.94 miles
Tile draining.....	1,081 rods
Culverts.....	1
Bridges.....	7

OXFORD

Owing to the increased traffic during the last few years, the surface of many of the macadam roads is becoming rough and rutted. Greater attention should be paid to systematic maintenance and repair of these roads.

During 1918 two of the most important county roads, the Ingersoll-Tillsonburg Road and the Woodstock-Tavistock Road, were designated and approved as Provincial County Roads. A patrol system has been adopted on both these roads and results show a big improvement.

The work done throughout the season was not very extensive. A considerable amount of finishing was completed on work undertaken late in 1917.

Main Street in the Village of Norwich was graded and metalled. This was undertaken under a special grant made by the County to Norwich Village by by-law.

On the new Durham Road considerable grading was done along the whole length of this road for a distance of $3\frac{1}{2}$ miles. A tractor rented by the County accomplished good results here.

On County Road No. 29 east from Plattsville one mile and a half of crushed gravel was placed and rolled and this is a very fair piece of work.

In the Township of East Nissouri, south of Lake Side on County Road No. 14, one mile of gravelling was done. Considerable summer traffic to the lake is to be found here.

In all, three reinforced concrete bridges were constructed during 1918 by the County of Oxford.

On County Road No. 27, Blandford Township, in Concession II, a concrete bridge of 16-foot span, at a cost of \$910.00, was constructed.

On County Road No. 7, in Lot 13 of West Oxford Township, a concrete bridge of 15-foot span, at a cost of \$1,187.75, was constructed.

On County Road No. 7, in Concession III, West Oxford, just north of Folder's Corner, a concrete bridge of 16-foot span was built. Owing to the nature of the wet foundation, the whole bridge settled below the surface of the road and the consequence is that the surface of the water is within a few inches of the bottom of the concrete floor of the bridge. Greater attention in the matter of proper inspection should be paid to these permanent structures throughout the county.

Good work was accomplished by scarifying, reshaping and rolling many of the old rutted macadam roads during the year.

MIDDLESEX

The work for the season of 1918 in Middlesex County consisted chiefly in gravelling and general maintenance.

In the Village of Glencoe, Main Street, southerly from the Grand Trunk Railway tracks, was graded and metalled from the Glencoe Gravel Pit. The gravel was laid 14 feet wide and 10 inches in depth. This is a great improvement over the previous poor condition of this portion of the street. The cost of this half mile was \$1,000.00.

Just north of Glencoe on County Road No. 6 considerable gravelling was done for a distance of 1.5 miles, at a cost of \$3,323.93.

On County Road No. 24 the Komoka Hill was graded and drained. A culvert and necessary catch basins were also constructed. The cost of this work amounted to \$792.78. This work completed a very necessary improvement.

On one or two of the concrete bridges and culverts built during the last season, a little more care should be taken in the finish of the completed work.

During 1918 the Sarnia Gravel Road, the Proof Line Road, the Wyton-Thornedale-St. Mary's Road and the Longwoods Road, were designated and approved as Provincial County Roads.

On the Sarnia Gravel Road a concrete culvert was built at a cost of \$538.95, with a clear span of 8 feet. From the Lambton County boundary westerly considerable grading was done for a distance of 8 miles.

The Proof Line Road, under the increased traffic of recent years, had become rutted and here the improvement consisted of picking with the roller, shaping and re-rolling without adding any new material. The cost of this maintenance work was approximately \$60.00 per mile.

Practically all the permanent structures have been built on this road, with the exception of a bridge in Concession XI of London Township, just south of the Village of Birr. It is the intention of the county to build the bridge in 1919.

General maintenance work was undertaken on the Wyton-St. Mary's Road.

On the Longwoods Road, a new reinforced concrete floor was laid on the Delaware Bridge. Other portions of this road were improved by resurfacing with gravel, tile drainage and general maintenance work.

During 1918 approximately 28 miles of additional county roads were added to the system under By-law No. 835. These consisted of the Hyde Park-Byron Road, the Newbury Road and some mileage lying opposite to agricultural land in the outlying portions of the towns and villages.

A suburban area was established adjacent to the City of London and a commission was appointed during 1918. Approximately \$8,200 was spent in maintaining these 50 miles of roads in the suburban area.

Road conditions in Middlesex County have changed during the last few years. The gravel roads which carried the traffic up to a few years ago are now fast requiring greater maintenance work. A higher type of construction, at least on the main roads adjacent to the City of London, seems necessary. With regard to the general condition of the county roads, Middlesex County, with its abundance of good gravel and systematic maintenance diligently applied, will be able to keep its mileage in good shape.

HURON

During the season of 1918 work done under the Highway Improvement Act in Huron County on the designated system of county roads consisted largely in bridge and culvert construction.

In September, 1918, the road known as the London Road, passing through Centralia, Exeter, Hensall, Clinton, Blythe, Belgrave and Wingham, and designated as County Road No. 1, was approved as a Provincial County Road. At this time County Road No. 2, from Dublin to Goderich, known as the Huron Road, was also approved as a Provincial County Road.

During the year two crushers and two bins (Sawyer-Massey), also one elevator and heavy grader were purchased by the County.

Among the more important bridges erected were the following: The Dungannon Bridge (80-foot concrete arch), the Harris Bridge (reinforced concrete bridge), the Hoggs Bridge (steel and concrete), and the Treebner Bridge (reinforced concrete beam).

The most important of the above was the completion of the concrete arch bridge spanning the Nine Mile River on the fourth concession of Ashfield, known as the Dungannon Bridge. The span is 80-foot clear and 120 feet in length in all. Nearly three thousand bags of cement were used in its construction and ten tons of steel rods for reinforcement. The arch is sixteen feet in height and the height over all is twenty-three feet, the three-foot panelled railing along the top giving the structure a handsome appearance. The old bridge (known popularly as Disher's Bridge) had been there for twenty-one or twenty-two years, and this is the third bridge built at this place in half a century. The new bridge is set on almost solid rock. The "slab" of the archway weighs 360 tons and it took thirteen bents to carry it. A feature of the work was the speed with which it was constructed. Although traffic was stopped for ten weeks, the bridge was actually built in twenty-six days. The contractors were Messrs. Sandy and Grant, of Lochalsh, and the total cost was \$8,266.97.

In the northwestern corner of Ashfield Township two disconnected portions of County Roads might well be re-considered, as the present location leaves a disconnected portion between Bruce County and Huron County along the Lake Shore Road, which has been designated and approved as a Provincial County Road.

Huron County roads consist of well graded old gravel roads, many of which were built fifty or sixty years ago. Road material seems to be fairly plentiful.

The work completed during 1918 consisted of 3.38 miles of gravelling, 280 rods of tile draining, 5 bridges (4 completed, 1 to finish) and 5 culverts.

NORTHUMBERLAND AND DURHAM

The United Counties of Northumberland and Durham adopted a system of County Roads in March, 1918, which comprises 381 miles, or 14 per cent. of the total road mileage in these Counties. The system appears to have been well selected with a view to serving equitably all portions of the Counties and linking up the chief centres, a commendable feature being the almost entire absence of dead ends. Gravel is plentiful throughout the Counties, and will no doubt be utilized in the construction of the County Roads.

Construction work on County Roads in 1918 included a number of short sections of grading and gravelling amounting to 10 miles in length. Two concrete slab bridges, 20-foot span, were built.

The work on Provincial County Roads consisted in resurfacing with gravel in many places and repairing and extending culverts.

No extensive work is contemplated until the return of normal times.

The grants to towns and villages amounted to approximately one-third of the total expenditure on construction.



IMPROVED SECTION OF GRAVEL ROAD ON THE PROVINCIAL HIGHWAY.

The roadway formerly descended to a narrow culvert, approached by a narrow earth embankment. A concrete culvert was built the full width of a thirty-foot road, and the earth from this hill was used to widen the embankment at the culvert. This is characteristic of work on the Provincial Highway.

APPENDIX F

PROVINCIAL HIGHWAYS

TORONTO, March 31st, 1919.

W. A. McLEAN, Esq.,

Deputy Minister of Highways, Ontario.

SIR:—

In accordance with 7 Geo. V, c. 16, s. 12, subsec. 1, I have the honour to submit to you a report and certified statement covering work done and expenditure made over periods stated for maintaining the Provincial Highways. During the year a number of additional highways were assumed by the Department, and these extensions, together with the mileage and date on which the roads were taken over, are as follows:—

Within the limits of the Village of Newcastle a continuation of the Provincial Highway 1.23 miles in length assumed June 10th, 1918.

Within the limits of the Town of Whitby a continuation of the Provincial Highway 1.64 miles in length assumed June 10th, 1918.

Within the limits of the Town of Bowmanville a continuation of the Provincial Highway 1 mile in length assumed August 20th, 1918.

The Ottawa-Prescott Highway 57.6 miles in length assumed August 15th, 1918.

The Hamilton-Queenston Highway 29.6 miles in length assumed August 15th, 1918.

The Napanee-Kingston Highway 22.7 miles in length assumed August 15th, 1918.

The Grafton-Belleville Highway 32.4 miles in length assumed October 1st, 1918.

On January 1st, 1919, the Cobourg and Port Hope Toll Road 5.04 miles in length was purchased by the Department and is now a link in the system of Provincial Highways.

The maintenance of the above roads was immediately proceeded with after the highways were assumed, and this report describes work done from that date up until January 31st, 1919.

Maintenance work on the Provincial Highway in the Counties of Ontario and Durham was also continued, and the improvements carried out between January 3rd, 1918, and January 31st, 1919, will be given in detail.

I.—PROVINCIAL HIGHWAY EASTWARD FROM TORONTO

Statement of Expenditure on the Provincial Highway during the period
January 3rd, 1918, to January 31st, 1919, in

ONTARIO COUNTY

Maintenance

The bridge over the Rouge River on the Provincial Highway was under the authority of the County when assumed by the Province. During the year lumber was purchased for renewing the handrails and guardrails and some plank for flooring at a cost of \$387.90. The west abutment which had settled out of position caused the steelwork to rest against the bridge seat. This was raised at a cost of \$26.76, and some new bolts were purchased for the guardrails at a cost of \$53.80.

The bridge at the west end of Pickering Village was also under the County authority upon assumption by the Province. During the year new stringers were placed in this bridge at a cost for labour of \$48.46, and required spikes were purchased for \$5.20. This bridge was given two coats of paint at a total cost of \$174.65.

Summary

All charges included in the following totals for work done in the County of Ontario cover only paysheets for men and teams and accounts for materials used in maintenance of the bridges for the period stated.

Maintenance

	<i>Total Expenditure.</i>	<i>Cost to Municipality.</i>	
Rouge Bridge—			
Lumber	\$387 90	\$116 37	
Raising Bridge Seat—			
Labour	26 76	8 03	
Bolts, etc.	53 80	16 14	
	<hr/> \$468 46	<hr/> \$140 54	\$140 54
Pickering Bridge—			
Paint	\$84 65	\$25 39	
Labour, Painting	90 00	27 00	
“ Placing Stringers	48 46	14 54	
Spikes, etc.	5 20	1 56	
	<hr/> \$228 31	<hr/> \$68 49	\$68 49
Total Cost to County			<hr/> \$209 03

Statement of Expenditure on the Provincial Highway during the period
January 3rd, 1918, to January 31st, 1919, in

PICKERING TOWNSHIP

Earthwork Construction

On the Rouge Hill adequate side ditches to take care of the surface flow of water and to carry off the ground water were entirely lacking. To prepare the roadbed for improvement it was necessary that proper ditches be constructed. On the westerly hill a side ditch was excavated on the south side of the road from the foot of the hill to a point a short distance from the summit and the beneficial effect of this drain on the roadway was very marked. On the north side of the road the ditch was cleaned out so that the water could get away more readily.

At Petticoat Creek, after the new concrete culvert was finished, a large amount of grading was undertaken. The old bridge opening was filled in and the roadway widened out and made safe for travel. This made a much needed improvement in the highway, as the old road was very narrow and, due to obscured vision, was rather dangerous.

A concrete culvert was completed at station 6254, a short distance east of Petticoat Creek, and the narrow roadway existing at that point was graded out and considerably widened.

For some distance east and west of Dunbarton School the alignment of the highway was improved, and a large amount of grading completed. The highway had been very narrow in this vicinity, and immediately in front of the school two vehicles could hardly pass when going in opposite directions. The cutting at this point was considerably widened out and the earth removed was used to provide additional width for the embankment to the west. East from the school the line of the road was straightened and widened out to the full Provincial Highway width. The total length of highway improved at this location was 2,200 feet.

During April, 1918, the highway in front of Lot 6 became very soft, and at times was hardly passable. This condition was due almost entirely to insufficient side ditches and proper drainage. To improve this section of road full size side ditches were constructed on both sides of the highway for a distance of half a mile. These ditches were of immediate benefit to the road and a harder surface was obtained.

The total cost of all the above earthwork which is chargeable to construction was \$4,740.99.

Tile drainage was found to be necessary at several points on the Rouge Hill and also at Lot 6, and in all 150 feet of 8-inch tile was installed at a cost of \$62.18.

Three reinforced concrete culverts were constructed in the Township and a reinforced concrete extension was added to one stone culvert.

A concrete culvert 41 feet long and with opening 9 feet high and 16 feet wide was built at Petticoat Creek. The culvert contained 229 cubic yards of concrete and was completed at a total cost of \$2,732.35.

A short distance east of Petticoat Creek a concrete culvert 49 feet long and with opening 3 feet wide and 4 feet high and containing 49 cubic yards of concrete was completed at a cost of \$773.21.

Just west of Dunbarton School house a reinforced concrete extension $34\frac{1}{2}$ feet long, 4 feet wide and 5 feet high was added to the stone culvert at that point at a cost of \$884.63.

Immediately east of Dunbarton School house a concrete culvert $58\frac{1}{2}$ feet long, $2\frac{1}{2}$ feet wide and 3 feet high and containing 60 cubic yards of concrete, was completed at a cost of \$692.83.

Three vitrified tile culverts 78 feet in total length were constructed under the three entrances opposite Mr. Flemming's property at a total cost of \$115.61, while guard rails to protect these culverts were built at a cost of \$20.46.

Maintenance of the highway was proceeded with and a heavy coat of gravel was applied to a length of $3\frac{3}{4}$ miles, while patching of the surface with gravel was continued over a distance of $6\frac{1}{4}$ miles. During such periods of weather as were favourable to dragging, work of this nature was carried out, and the road kept rounded up and in fair surface. About one mile of road was scarified, graded and consolidated with a steam traction outfit.

The entire cost of the above work of gravelling, patching, scarifying and dragging was charged to maintenance and totalled \$3,831.23.

Repairs to bridges and culverts were kept up. Planks were placed in the culverts at the top of the west side of Rouge Hill and the culvert $\frac{1}{4}$ mile east of Petticoat Creek was kept in repair until replacement could be made. A side culvert in Pickering Village and a culvert one mile east of Pickering were also repaired. The total cost of this work was \$64.65.

Guard rails at Petticoat Creek, Liverpool Corner and one mile east of Pickering were constructed and whitewashed at a total cost of \$46.25.

During the winter season the road was kept open and passageway cleared through drifts. Weed cutting was looked after at the proper time of year, and the total of both of these services was \$57.67.

Salvage of lumber used in culvert construction resulted in a credit to Pickering Township of \$367.76, being the value of lumber transferred to the Town of Bowmanville.

Summary

All charges included in the following totals for work done in the Township of Pickering, cover only pay sheets for men and teams and accounts for materials used in construction and maintenance of the road for the period stated.

Construction

	<i>Total Expenditure.</i>	<i>Cost to Township.</i>	
Earthwork	\$4,820 99	\$1,446 30	
Tile draining	62 18	18 65	
Bridges and Culverts—			
Petticoat Creek Culvert..	2,732 35	819 71	
Culvert, Station, 6254+00	773 21	231 96	
Extension to Culvert, Sta-			
tion 6211+29	884 63	265 39	
Culvert, Station 6201+88	692 83	207 85	
Tile Culverts	115 61	34 68	
Guard rail	20 46	6 14	
	<hr/>	<hr/>	
	\$10,102 26	\$3,030 68	
Credit on lumber used at			
Bowmanville	367 76	110 33	
	<hr/>	<hr/>	
	\$9,734 50	\$2,920 35	\$2,920 35

Maintenance

	<i>Total Expenditure.</i>	<i>Cost to Township.</i>	
Gravelling and patching			
Highway	\$3,831 23	\$1,149 37	
Bridge and Culvert Repairs	64 65	19 39	
Guard Rails	46 25	13 88	
Clearing Snow and Cutting			
Weeds	57 67	17 30	
	<hr/>	<hr/>	
	\$3,999 80	\$1,199 94	\$1,199 94

Total Cost to Township \$4,120 29

Statement of Expenditure on the Provincial Highway during the period January 3rd, 1918, to January 31st, 1919, in

PICKERING VILLAGE

In accordance with the wishes of the Board of Trustees of the village, about one mile of the Provincial Highway through the Municipality was given a coat of 40 per cent. asphaltic oil. The oil was applied as a dust layer and effectively served its purpose during the dry summer season.

The cost of this work to the Municipality was as follows:—

Maintenance

	<i>Total Expenditure</i>	<i>Cost to Village</i>	
Labour	\$48 61	\$14 58	
Oil	253 15	75 95	
	<hr/>	<hr/>	
	\$301 76	\$90 53	
Total Cost to Village			\$90 53

Statement of Expenditure on the Provincial Highway during the period January 3rd, 1918, to January 31st, 1919, in

WHITBY WEST TOWNSHIP**Construction**

A short distance west of the Town of Whitby, ditches were constructed on both sides of the highway for a distance of 500 feet. About one-half mile east of the Town of Whitby ditches were dug on each side of the road and a narrow roadbed was widened out. The total distance covered by this work was 1,500 feet. The total cost of the above work was \$954.35.

Three vitrified tile culverts each 18 feet in length were placed under farm entrances at stations 5618, 5778 and 5779. The total length of 18-inch tile laid was 54 feet at a total cost of \$8,221.00.

A guard rail at culvert at station 5613+52 was completed at a cost of \$3.00.

Maintenance

The gravelling of the road surface for a width of 16 feet was proceeded with for a distance of 2,100 feet westerly from the Town of Whitby. Easterly from the Town of Whitby a heavy coat of gravel was applied for a distance of 1,800 feet. The total distance gravelled was approximately three-quarters mile. For a distance of 3,100 feet west of Whitby Town and also one mile east, the old roadbed was scarified, regraded and consolidated with a tractor. The entire cost of all the above work was \$813.24.

Repairs to one and replacements of two culverts at stations 5609, 5610 and 5801, were completed at a cost of \$16.10.

Summary

All charges included in the following totals for work done in the Township of Whitby West, cover only pay sheets for men and teams and accounts for material used in construction and maintenance of the road for the period stated.

Construction

	<i>Total Expenditure.</i>	<i>Cost to Township.</i>	
Ditching	\$954 35	\$286 30	
Pipe Culverts	82 21	24 66	
Guard Rail	3 00	90	
	<hr/> \$1,039 56	<hr/> \$311 86	\$311 86

Maintenance

	<i>Total Expenditure.</i>	<i>Cost to Township.</i>	
Gravelling	\$813 24	\$243 97	
Culvert Repairs	16 10	4 83	
	<hr/> \$829 34	<hr/> \$248 80	\$248 80
Total Cost to Township....			<hr/> \$560 66

Statement of Expenditure on the Provincial Highway during the period June 10th, 1918, to January 31st, 1919, in

WHITBY TOWN**Construction**

On the section of the Provincial Highway assumed from the westerly limits of the Town easterly, it was necessary to provide efficient side ditches to drain the subgrade of the road, which was wet and springy over the entire distance. Full width side ditches were excavated and an improvement in the road was evident. All material removed from the side ditches was used to advantage in widening the subgrade of the roadway at narrow locations. The total cost of this work was \$1,325.25.

Pipes were placed under all farm and house entrances wherever side ditches were excavated. In all a total length of 148 lineal feet of tile was put in at a total cost of \$262.58.

Maintenance

A heavy layer of gravel was applied to the highway at the easterly and westerly ends of the town. This material was spread to a width of about 15 feet and had a depth of about 9 inches. It served to provide a smoother road surface and prevented the crust breaking during wet spring weather when the foundation was soft.

On the continuation of the Provincial Highway through the Municipality, an agreement was made with the Town Council to scarify the old roadbed and after loosening the surface to level it off and re-roll the material. This was carried out and gave a fair road for travel. The entire cost of all the above work was \$2,725.53.

Two guard rails were repaired at a cost of \$1.50.

Summary

All charges included in the following totals for work done in the Town of Whitby, cover only pay sheets for men and teams and accounts for material used in construction and maintenance of the road for the period stated.

Construction

	<i>Total Expenditure.</i>	<i>Cost to Town.</i>	
Ditching	\$1,325 25	\$397 57	
Tile Pipe	262 58	78 77	
	<hr/>	<hr/>	
	\$1,587 83	\$476 34	\$476 34

Maintenance

	<i>Total Expenditure.</i>	<i>Cost to Town.</i>	
Gravelling	\$2,725 53	\$817 66	
Guard Rail Repairs	1 50	45	
	<hr/>	<hr/>	
	\$2,727 03	\$818 11	\$818 11
Total Cost to Town			<hr/> \$1,294 45

Statement of Expenditure on the Provincial Highway during the period January 3rd, 1918, to January 31st, 1919, in

WHITBY EAST TOWNSHIP**Construction**

For a distance of 2,500 feet in the vicinity of Oshawa Cemetery, the north and south side road ditches were opened up and the material used to widen the roadway at the new concrete culvert. West of Oshawa, side road ditches having a total length of 3,100 feet were dug to provide better drainage for the roadbed. The total cost of this work was \$1,202.05.

On the south side of the road from the large culvert at station 5562+50, an eighteen inch tile pipe was placed in the side ditch and backfilled so that only a slight depression sufficient to take care of surface water was left. This tile was installed at a cost of \$196.97.

The new concrete culvert at station 5562+00 was completed and accounts rendered to a total of \$915.74.

Maintenance

For a distance of 1¼ miles west of Oshawa, a crushed gravel road surface was constructed. This surface was 18 feet wide and nine inches deep, and it was well rolled and consolidated. Gravel was applied to the surface of the roadway for a distance of 1.4 miles east of Oshawa and for a distance of 2.7 miles the roadway was kept well dragged and levelled. The total cost of gravelling the 2.65 miles together with dragging was \$5,943.22.

Wooden culverts were constructed at six farm entrances, new stringers were placed in culvert at station 5406+50, and all culvert openings kept well cleaned out at a total cost of \$149.94. A new guard rail was placed at culvert at station 5562+00 at a cost of \$3.00, while removal of snow and weed cutting cost \$8.10.

Summary

All charges included in the following totals for work done in the Township of Whitby East, cover only pay sheets for men and teams and accounts for material used in construction and maintenance of the road for the period stated.

Construction

	<i>Total Expenditure.</i>	<i>Cost to Township.</i>	
Ditching	\$1,202 05	\$360 61	
Tile Pipe	196 97	59 09	
Completion of Culvert	915 74	274 72	
	<hr/>	<hr/>	
	\$2,314 76	\$694 42	
Credit on lumber used in Pickering Township	200 00	60 00	
	<hr/>	<hr/>	
	\$2,114 76	\$634 42	\$634 42

Maintenance

	<i>Total Expenditure.</i>	<i>Cost to Township.</i>	
Gravelling	\$5,943 22	\$1,782 96	
Culverts	149 94	44 98	
Guard Rails	3 00	22	
Weed Cutting and Snow Removal	8 10	2 43	
	<hr/> \$6,104 26	<hr/> \$1,831 27	<hr/> \$1,831 27
Total Cost to Township....			<hr/> \$2,465 69

Statement of Expenditure on the Provincial Highway during the period January 3rd, 1918, to January 31st, 1919, in

DARLINGTON TOWNSHIP**Construction**

Upon taking over this section of road the drainage was found to be very poor and ditches were entirely lacking in many places. This necessitated the excavation of 1,000 lineal feet of ditch west of Bowmanville and 2,700 lineal feet of ditching 1 mile east of Bowmanville at a total cost of \$649.60.

Pipe culverts were also installed as follows:—48 feet of 18" vitrified pipe installed at side road at Courtice Corners and old 12" pipe removed.

Old pipe culvert half mile east of Courtice was lowered and the ends extended; 32 feet of 18" vitrified pipe north side road $1\frac{1}{2}$ miles east of Courtice; 20 feet of 12" concrete pipe, north side farm entrance opposite Bowmanville Cemetery; 5 feet 18" vitrified pipe, south gate entrance, were installed one mile east of Bowmanville Cemetery; also 34' of 18" pipe across the road. The total cost for labour and materials was \$617.97.

Guard rails were removed at eight culverts on this road at a cost of \$44.65.

Maintenance

On account of the poor drainage the subgrade had softened and allowed the surface to break through in many places. It was found necessary to place a new coat of gravel on six miles of road west of Bowmanville and over one mile east of Bowmanville. Also $\frac{3}{4}$ of a mile of road east of Bowmanville had the holes filled with gravel and the surface patched where worn or broken through. Also about eight miles of road was dragged. The total cost for maintaining this surface was \$4,275.70.

A guard rail was repaired east of Edmondsons Mill at a cost of \$6.20.

Snow removal was carried out during the winter at a cost of \$9.50.

Summary

All charges included in the following totals for work done in the Township of Darlington cover only pay sheets for men and teams and accounts for materials used in the construction and maintenance of this road during the period stated.

Construction

	<i>Total Expenditure.</i>	<i>Cost to Township.</i>	
Earthwork	\$649 60	\$194 88	
Pipe Culverts	617 97	185 39	
New Guard Rails	44 65	13 40	
	<hr/> \$1,312 22	<hr/> \$393 67	<hr/> \$393 67

Maintenance

	<i>Total Expenditure.</i>	<i>Cost to Township.</i>	
Road Surface	\$4,275 70	\$1,282 71	
Repairs to Guard Rail	6 20	1 86	
Cleaning Snow	9 50	2 85	
	<hr/> \$4,291 40	<hr/> \$1,287 42	<hr/> \$1,287 42
Total Cost to Township.....			<hr/> \$1,681 09

Statement of Expenditure on the Provincial Highway during the period August 20th, 1918, to January 31st, 1919, in

BOWMANVILLE TOWN

Construction

Two new bridges were found to be necessary and were installed at stations 4951 and 4960 of 52 feet and 39 feet spans respectively, each having a 20-foot roadway and one 6-foot sidewalk. The total cost of abutments, steel and erecting of the longer span was \$7,177.21. The cost of the shorter bridge was \$2,866.44, erected. The cost of grading the approaches was \$1,125.66. Twenty-four feet of 12" concrete pipe culvert was laid under side entrance opposite the cemetery at a cost of \$5.00.

Maintenance

The road surface was repaired by giving a complete coat of gravel over 1,000 feet in the west part of the town, 1,300 feet opposite the fair grounds and 1,200 feet between the new bridges. This part of the road was also dragged, the cost for gravelling and dragging being \$253.55.

Summary

All charges included in the following totals for work done in the Town of Bowmanville cover only pay sheets for men and teams and accounts for materials used in the construction and maintenance of this portion of the road during the period stated. The Municipal Corporation is asked to pay 60 per cent. of the expenditure made to date.

Construction

	<i>Total Expenditure.</i>	<i>Cost to Town.</i>	
Bridge at Station 4951.....	\$7,177 21	\$4,306 33	
Bridge at Station 4960.....	2,866 44	1,719 86	
12" pipe culvert	5 00	3 00	
Earthwork	1,125 66	675 40	
	<u>\$11,174 31</u>	<u>\$6,704 59</u>	\$6,704 59

Maintenance

	<i>Total Expenditure.</i>	<i>Cost to Town.</i>	
Gravelling and dragging ..	\$253 55	\$76 06	\$76 06
Total cost to Town.....			<u>\$6,780 65</u>

Statement of Expenditure on the Provincial Highway during the period of January 3rd, 1918, to January 31st, 1919, in

CLARKE TOWNSHIP

Construction

The surface of this road when taken over was in a very rough condition, very badly drained and, especially west of Newtonville, very narrow. This necessitated ditching and widening the road for 1,200 feet along the north side of the swamp west of Newtonville. The grades were also reduced, road bed widened and ditching was carried on for 4,000 feet between Newtonville and the swamp. Also 800 feet of road was ditched and widened one-half mile west of Newtonville. The total cost of all the above earthwork was \$1,959.16.

Seven pipe culverts were installed at farm entrances, side roads, and across the road at a total cost of \$161.00. The steel was delivered at the site for the new bridge over Wilmot Creek at a cost of \$2,141.06. Five new guard rails were erected at a total cost of \$30.50.

Maintenance

Over one mile of road west of Newcastle, three miles between Newcastle and Newtonville and half a mile of road east of Newtonville were given a light coat of gravel. Holes were patched with gravel on $1\frac{3}{4}$ miles of roadway. Shoulders were graded on two miles of road east of Newtonville and eight miles of road were dragged. The total cost was \$1,181.78.

Box culverts at station 4459 was repaired at a cost of \$8.00 and the guard rail repaired at a cost of \$14.50. The cost of removing snow and cutting weeds during this period amounted to \$106.81.

Summary

All charges included in the following totals for work done in the Township of Clarke cover only pay sheets for men and teams and accounts for materials used in the construction and maintenance of this portion of the road during the period stated.

Construction

	<i>Total Expenditure.</i>	<i>Cost to Township.</i>	
Earthwork	\$1,959 16	\$587 75	
Culverts	161 00	48 30	
Bridge Steel	2,141 06	642 32	
Guard Rails	30 50	9 15	
	<hr/>	<hr/>	
	\$4,291 72	\$1,287 52	\$1,287 52

Maintenance

	<i>Total Expenditure.</i>	<i>Cost to Township.</i>	
Road Surface	\$1,181 78	\$354 52	
Cudvert Repairs	8 00	2 40	
Guard Rail Repairs	14 50	4 35	
Snow and Wood Removal.	106 81	32 04	
	<hr/>	<hr/>	
	\$1,311 09	\$393 31	\$393 31
Total Cost to Township..			<hr/>
			\$1,680 83

Statement of Expenditure on the Provincial Highway during the period of June 10th, 1918, to January 31st, 1919, in

NEWCASTLE VILLAGE

Construction

In order to carry off surface water on this stretch of road it was necessary to do 100 feet of ditching on the south side of the road in the west end of the village, taking out the old sidewalk and filling in. Also the road bed was widened and ditched on both sides west of the C. P. R. Bridge. The total cost for the above work was \$744.75.

Six pipe culverts were placed at side entrances at a total cost of \$341.19. One concrete catch basin and cover was installed at a cost of \$12.50.

Maintenance

1.1 miles of road was gravelled. The shoulders were graded on 1 mile along both sides and 1.5 miles was dragged, the total cost being \$544.99. Guard rails near telegraph office and near C. P. R. subway were repaired at a cost of \$9.00.

Summary

All charges included in the following totals for work done in the Village of Newcastle cover only pay sheets for men and teams and accounts for materials used in the construction and maintenance of this portion of the road during the period stated.

Construction

	<i>Total Expenditure.</i>	<i>Cost to Village.</i>	
Earthwork	\$744 75	\$223 42	
Pipe Culverts	341 19	102 36	
Catch Basin	12 50	3 75	
	<hr/>	<hr/>	
	\$1,098 44	\$329 53	\$329 53

Maintenance

	<i>Total Expenditure.</i>	<i>Cost to Village.</i>	
Road Surfacing	\$544 99	\$163 49	
Guard Rails	9 00	2 70	
	<hr/>	<hr/>	
	\$553 99	\$166 19	\$166 19
			<hr/>
Total Cost to Village			\$495 72

Statement of Expenditure on the Provincial Highway during the period, January 3rd, 1918, to January 31st, 1919, in

HOPE TOWNSHIP**Construction**

Ditching and widening of the road bed was carried on in ten places between Hope and Clarke Township line and Port Hope, in all 10,600 lineal feet of road for a total cost of \$3,138.95.

Five new 18" pipe culverts were placed in side entrances and one 15" pipe culvert was extended, the cost for this work complete being \$262.67. Five new concrete culverts were built on this stretch of road ranging in size from 4' x 5' to 3' x 2', the total cost for these culverts being \$3,563.14. Six new guard rails were supplied and erected at a cost of \$59.65.

Maintenance

It was found necessary to give 2.4 miles of this road a new coat of gravel. Eight miles of road were dragged. The total cost was \$3,267.62. Two old culverts were repaired. Some stone was placed around the north end of foundations of new culvert at station 4163 to prevent scouring and some broken concrete pipes were taken out. The total cost of this work was \$106.34.

Repairs were made to five guard rails at a total cost of \$47.66. Removing snow in the winter was found necessary, costing \$163.37.

Summary

All charges included in the following totals for work done in the Township of Hope, cover only pay sheets for men and teams and accounts for materials used in the construction and maintenance of this portion of the road during the period stated.

Construction

	<i>Total Expenditure.</i>	<i>Cost to Township.</i>	
Earthwork	\$3,138 95	\$941 69	
Culverts and Bridges	3,825 81	1,147 74	
Guard Rails	59 65	17 89	
	<hr/>	<hr/>	
	\$7,024 41	\$2,107 32	
Less lumber credit	236 47	70 94	
	<hr/>	<hr/>	
	\$6,787 94	\$2,036 38	\$2,036 38

Maintenance

	<i>Total Expenditure.</i>	<i>Cost to Township.</i>	
Road Surface	\$3,267.62	\$980 29	
Culverts	106 34	31 90	
Guard Rails	47 66	14 30	
Snow Removal	163 37	49 01	
	<hr/>	<hr/>	
	\$3,584 99	\$1,075 50	\$1,075 50
			<hr/>
Total Cost to Township...			\$3,111 88

ASSESSMENT OF COST OF COBOURG AND PORT HOPE TOLL ROAD

W. A. McLEAN, Esq.,

Deputy Minister of Highways, Ontario.

SIR,—

On January the 1st, 1919, the Cobourg and Port Hope Toll Road, 5.04 miles in length, was purchased by this Department at a cost of \$8,000.00, and in accordance with Section 30 of the Provincial Highway Act I have to report as follows on the distribution of the cost of the road upon the municipalities, the corporations and the Department of Public Highways.

The Department of Public Highways will bear 40 per cent. of the cost of this road. I would consider that it would be equitable for the United Counties of Durham and Northumberland to pay 25 per cent. of the cost of the road as in the case of the Cobourg and Baltimore Toll Road. There is left 35 per cent. of the cost of the road to be distributed upon the municipal corporations within which or adjacent to which the road lies, and which are locally benefited by the road, namely, the Town of Port Hope, the Town of Cobourg, the Township of Hope and the Township of Hamilton.

In making a distribution of the cost, the assessments of the municipalities interested should be taken into consideration, and in the case of the four municipalities above mentioned the assessments are almost identical, varying approximately from two million one hundred thousand dollars to two million three hundred and seventy-five thousand dollars. I would, therefore, consider that five per cent. of the cost of this road might equitably be charged to each of the four municipalities.

The Towns of Cobourg and Port Hope are directly benefited by the abolition of tolls on this road, and for this benefit I would make an assessment of four per cent. on each of the towns. This makes the total levy on the Town of Port Hope of 9 per cent. of the cost of the road, and the same amount, namely, 9 per cent. of the cost of the road, would also be paid by the Town of Cobourg.

In the case of the Township of Hope it should be pointed out that the road lies in the south-east corner of the township and is used by a comparatively small number of the ratepayers of that township. I would, therefore, consider that no charge should be made against the Township of Hope for benefit in the abolition of this road, because of the location of the road in the township, and also because of the fact that it would be used by a very small number of the ratepayers of the Township of Hope, and I would consider that the levy against the Township of Hope on the basis of assessment should be reduced to three per cent. of the cost of the road.

In the case of the Township of Hamilton, I would consider that the levy of five per cent. of the cost of the road based on the assessment of the municipalities is fair, and in addition there is a special benefit to the ratepayers of this township, because of the abolition of tolls on this road, and for this special benefit a fair levy would be four per cent. of the cost of the road, as in the above cases of the Town of Port Hope and the Town of Cobourg.

The road passes through the Township of Hamilton for a distance of nearly 3½ miles, and is one of the main roads of travel for the ratepayers of that Township in reaching the Towns of Port Hope and Cobourg. I would, therefore, consider that the Township of Hamilton should pay more than the Towns of Port Hope and Cobourg, because of the fact that the road is of immediate and special benefit to the ratepayers of the Township of Hamilton, and for this special benefit I would make an assessment of five per cent. This would make the total levy on the Township of Hamilton towards the purchase price of this road of 14 per cent.

A summary of the assessment of cost of this road would be as follows:—

Summary

(Purchase price of road, \$8,000.00.)

Province of Ontario, assessed 40 per cent., or	\$3,200 00
Counties of Durham and Northumberland, assessed 25 per cent.....	2,000 00
Town of Port Hope, assessed 9%.....	720 00
Town of Cobourg " 9%.....	720 00
Township of Hope " 3%.....	240 00
Township of Hamilton " 14%.....	1,120 00
Total	\$8,000 00

All of which is respectfully submitted,

GEO. HOGARTH,
Chief Engineer.

Statement of Expenditure on the Provincial Highway during the period October 1st, 1918, to January 31st, 1919, in

HALDIMAND TOWNSHIP

It was found necessary to increase the width of several stretches of the road in this township to make it safe for traffic; also ditching was done on these parts of the road. The total length thus treated was 4,500 feet at a total cost of \$135.10.

The surface was full of holes and practically broken through in the badly drained parts necessitating a new coat of gravel on 3.1 miles of road. The holes were filled and the surface patched over 2.8 miles. Grading was carried on to bring the shoulders back to shape over both sides of a quarter of a mile of road. The total cost for surface maintenance was \$2,807.35.

Repairs were made to the 22-foot span bridge $1\frac{1}{2}$ miles east of Grafton at a cost of \$13.14.

Guard rails were renewed at seven culverts and were whitewashed at a cost of \$79.74.

Summary

All charges included in the following totals for work done in the Township of Haldimand, cover only pay sheets for men and teams and accounts for material used in the construction and maintenance of this portion of the road during the period stated.

Construction

	<i>Total Expenditure.</i>	<i>Cost to Township.</i>	
Earthwork	\$135 10	\$40 53	\$40 53

Maintenance

	<i>Total Expenditure.</i>	<i>Cost to Township.</i>	
Road Surface	\$2,807 35	\$842 21	
Bridges and Culverts	13 14	3 94	
Guard Rails	79 74	23 92	
	<hr/>	<hr/>	
	\$2,900 23	\$870 07	\$870 07

Total Cost to Township...

\$910 60

Statement of Expenditure on the Provincial Highway during the period October 1st, 1918, to January 31st, 1919, in

CRAMAHE TOWNSHIP

The drainage of the road through this township was practically negligible in places, necessitating a great deal of ditching and building up of the shoulders; 2,400 feet of ditching was done along the north side of the road at a cost of \$110.90. Also 18" pipe culvert $\frac{1}{2}$ mile west of Salem Factory was taken out and replaced 50 feet west at a cost of \$10.00.

The road surface was given a new coat of gravel over a distance of 3.5 miles, while patching and repairing were carried out over 1.6 miles. Shoulders were regraded and put in shape over one mile of road while dragging was carried out over five miles. This work, together with weed cutting over three miles of road, cost \$2,595.60.

The box culvert $\frac{3}{4}$ mile west of Salem Factory was repaired at a cost of \$5.00.

Four guard rails were also repaired at a total cost of \$41.32.

Summary

All charges included in the following totals for work done in the Township of Cramahe, cover only pay sheets for men and teams and accounts for materials used in the construction and maintenance of this portion of the road during the period stated.

Construction

	<i>Total Expenditure.</i>	<i>Cost to Township.</i>	
Earthwork	\$110 90	\$33 27	
Culverts	10 00	3 00	
	<hr/>	<hr/>	
	\$120 90	\$36 27	\$36 27

Maintenance

	<i>Total Expenditure.</i>	<i>Cost to Township.</i>	
Road Surface	\$2,595 60	\$778 68	
Culverts	5 00	1 50	
Guard Rails	41 32	12 40	
	<hr/>	<hr/>	
	\$2,641 92	\$792 58	\$792 58
Total Cost to Township ..			<hr/>
			\$828 85

Statement of Expenditure on the Provincial Highway during the period October 1st, 1918, to January 31st, 1919, in

COLBORNE VILLAGE

To improve the drainage in the village it was necessary to do 1,200 feet of ditching on the south side of the road near the east end of the village. The cost for this work was \$42.50.

A new concrete culvert was built at station 2722-25, the costs for which to the end of this period were \$92.00.

A new coat of gravel was placed on 1.2 miles of road in the village and dragging was carried on, the total cost being \$1,300.10.

Summary

All charges included in the following totals for work done in the Village of Colborne cover only pay sheets for men and teams and accounts for materials used in the construction and maintenance of this road during the period stated.

Construction

	<i>Total Expenditure.</i>	<i>Cost to Village</i>	
Earthwork	\$42 50	\$12 75	
Culverts	92 00	27 60	
	<hr/>	<hr/>	
	\$134 50	\$40 35	\$40 35

Maintenance

	<i>Total Expenditure.</i>	<i>Cost to Village</i>	
Surfacing	\$1,300 10	\$390 03	\$390 03
Total Cost to Village			<hr/>
			\$430 38

Statement of Expenditure on the Provincial Highway during the period October 1st, 1918, to January 31st, 1919, in

BRIGHTON TOWNSHIP

To improve the drainage 300 feet of ditching was done on the north side of the road ½ mile west of Brighton Village at a cost of \$13.00.

A guard rail was also erected at Station 2358 at a cost of \$9.00.

A total of 3.6 miles of road was gravelled to a width of 12 feet and depth of 9" in the township, while patching was carried out over one-half mile and dragging over 0.4 miles. Weeds were cut over 1½ miles and shoulders were shaped up over ¼ mile on both sides of the road. The total cost was \$5,588.57. One side entrance culvert ½ mile west of Brighton Village was repaired at a cost of \$1.50.

Summary

All charges included in the following totals for work done in the Township of Brighton, cover only pay sheets for men and teams and accounts for materials used in the construction and maintenance of this portion of the road during the period stated.

Construction

	<i>Total Expenditure.</i>	<i>Cost to Township.</i>	
Earthwork	\$13 00	\$3 90	
Guard Rail	9 00	2 70	
	<hr/> \$22 00	<hr/> \$6 60	\$6 60

Maintenance

	<i>Total Expenditure.</i>	<i>Cost to Township.</i>	
Road Surface	\$5,588 57	\$1,676 57	
Culverts	1 50	45	
	<hr/> \$5,590 07	<hr/> \$1,677 02	\$1,677 02
Total Cost to Township ..			<hr/> \$1,683 62

Statement of Expenditure on the Provincial Highway during the period October 1st, 1918, to January 31st, 1919, in

BRIGHTON VILLAGE

On account of poor drainage of surface water the subgrade had been softened and the road surface broken through in numerous places. To improve this condition ditches were cleaned out at several places at a cost of \$51.50. Also two 18" vitrified pipe culverts were installed for \$32.12. These amounts were charged to construction.

One and a quarter miles of road were gravelled and dragged, while the shoulders on both sides were sloped up and graded over $\frac{3}{4}$ of a mile of road.

Summary

All charges included in the following totals for work done in the Village of Brighton, cover only pay sheets for men and teams and accounts for materials used in construction and maintenance of this road during the period stated.

Construction

	<i>Total Expenditure.</i>	<i>Cost to Village.</i>	
Earthwork	\$51 50	\$15 45	
Culverts	32 12	9 64	
	<hr/> \$83 62	<hr/> \$25 09	\$25 09

Maintenance

	<i>Total Expenditure.</i>	<i>Cost to Village.</i>	
Road Surface	\$1,714 57	\$514 36	\$514 36
Total Cost of Village			<hr/> \$539 45

Statement of Expenditure on the Provincial Highway during the period October 1st, 1918, to January 31st, 1919, in

MURRAY TOWNSHIP

The only work done on this section of the road to be classed as construction was 400 feet of ditching on the north side of road east of culvert at station 2030+00 at a cost of \$3.00.

The maintenance of the road surface necessitated regraveling of 3.4 miles of road 12 feet wide and 9 inches deep. Also 1.2 miles of road was patched with gravel and holes filled.

The road was dragged over 5.4 miles and weeds were kept cut. The total cost was \$4,685.45.

One culvert $\frac{1}{2}$ mile east of Brighton Township line was repaired at a cost of \$5.00. Also the guard rail was repaired at this culvert for \$3.28.

Summary

All charges included in the following totals for work done in the Township of Murray, cover only pay sheets for men and teams and accounts for materials used in the construction and maintenance of this portion of the road during the period stated.

Construction

	<i>Total Expenditure.</i>	<i>Cost to Township.</i>	
Earthwork	\$3 00	\$0 90	\$0 90

Maintenance

	<i>Total Expenditure.</i>	<i>Cost to Township.</i>	
Road Surface	\$4,685 45	\$1,405 64	
Culverts	5 00	1 50	
Guard Rail	3 28	98	
	<u>\$4,693 73</u>	<u>\$1,408 12</u>	<u>\$1,408 12</u>
Total Cost to Township....			<u>\$1,409 02</u>

Statement of Expenditure on the Provincial Highway during the period October 1st, 1918, to January 31st, 1919, in

SIDNEY TOWNSHIP

The Provincial Highway in the Township of Sidney is ten miles in length and extends from the westerly limits of the City of Belleville to the easterly limits of the Town of Trenton. A very heavy through traffic between these centres of population has been passing over this highway for several years and lack of complete maintenance has been resulted in the road becoming very rough. The surface from end to end was full of small holes which filled with water during rainstorms and this condition tended to soften up the subgrade, rendering the road difficult to keep properly graded and rounded up. In several places the side ditches were entirely absent and the surface flow of water was not directed into proper channels. An improvement was effected in such cases by opening up adequate ditches to provide drainage.

To properly improve the surface of the roadway it was necessary to place a coating of gravel over the old material. This gravel was used to fill in holes and level off the travelled portion of the highway over the entire distance of ten miles. The cost of this work of maintenance averaged \$253.35, per mile or \$2,533.56 for the entire ten miles of the Provincial Highway within the township.

The guard rails on two timber bridges were in a decayed condition dangerous to public travel and were replaced at a total cost of \$100.90.

Summary

All charges included in the following totals for work done in the Township of Sidney, cover only pay sheets for men and teams and accounts for material used in maintenance of the road for the period stated.

Maintenance

	<i>Total Expenditure.</i>	<i>Cost to Township.</i>	
Gravelling	\$2,533 56	\$760 07	
Guard Rail Repairs	100 90	30 27	
	<u>\$2,634 46</u>	<u>\$790 34</u>	
Total Cost to Township ...			<u>\$790 34</u>

Statement of Expenditure on the Provincial Highway during the period August 15th, 1918, to January 31st, 1919, in

NORTH FREDERICKSBURG TOWNSHIP

East of the Town of Napanee the Provincial Highway extends through the Township of North Fredericksburg for a distance of 3.7 miles. An examination of this road when it was assumed by the Department, showed it to have deep ruts in the centre with high

shoulders at the sides and the entire surface was in a rough and unsatisfactory condition. To properly prepare the roadway, it was necessary to grade and ditch the entire distance of 3.7 miles and this was done at a cost of \$864.10.

Two farm entrance culverts were constructed and a dry masonry wall 40 feet in length and 4 feet high was constructed at Little Spring Creek. The total cost of this work was \$183.90, and is chargeable to construction.

After the grading was completed a course of stone was applied to the surface for the entire distance and well rolled. The resulting surface was free from roughness and under the present traffic passing over the highway should last in good condition for some little time. The cost of placing and rolling this stone was about 1,000 per mile for road or in all \$3,608.59.

Summary

All charges included in the following totals for work done in the Township of North Fredericksburg, cover only pay sheets for men and teams and accounts for material used in construction and maintenance of the road for the period stated.

Construction

	<i>Total Expenditure.</i>	<i>Cost to Township.</i>	
Culverts and masonry wall.	\$183 90	\$55 17	\$55 17

Maintenance

	<i>Total Expenditure.</i>	<i>Cost to Township.</i>	
Grading and ditching	\$864 10	\$259 23	
Applying broken stone and rolling	3,608 59	1,082 57	
	<u>\$4,472 69</u>	<u>\$1,341 80</u>	<u>\$1,341 80</u>
Total Cost to Township ..			\$1,396 97

Statement of Expenditure on the Provincial Highway during the period August 15th, 1918, to January 31st, 1919, in

ERNESTOWN TOWNSHIP

When the Provincial Highway was assumed in the Township of Ernestown and an inspection made it was found to be in bad repair. The surface was worn out for nearly the entire total distance of 11 miles and was very rough and uneven, being full of holes and depressions. In several places the ditches were not properly constructed and graded, while on other sections grading of the surface and shoulders of the road was needed. Because of the nature of the grading and ditching undertaken it has been classed as maintenance. The cost of such work was \$1,622.21, and a total distance of $\frac{3}{4}$ mile was completed.

Maintenance of the surface of the road was carried out by placing broken stone wherever required to level up and smooth the travelled highway. The work was carried out over a distance of 8 miles, 3.2 miles of which received a coating of stone approximately 8" in depth. The total cost of placing and rolling stone was \$4,348.30.

Summary

All charges included in the following totals of work done in the Township of Ernestown, cover only pay sheets for men and teams and accounts for material used in maintenance of the road for the period stated.

Maintenance

	<i>Total Expenditure.</i>	<i>Cost to Township.</i>	
Grading and ditching	\$1,622 21	\$486 66	
Applying broken stone and rolling	4,348 30	1,304 49	
	<u>\$5,970 51</u>	<u>\$1,791 15</u>	
Total Cost to Township...			\$1,791 15

Statement of Expenditure on the Provincial Highway during the period August 15th, 1918, to January 31st, 1919, in

KINGSTON TOWNSHIP

The total length of the Provincial Highway in the Township of Kingston is 8 miles and over this road a very heavy traffic passes to and from the City of Kingston. When the highway was assumed, some sections were in a rough condition and arrangements were completed for applying crushed stone to all portions requiring re-surfacing.

This crushed stone was applied to a depth of approximately 5 inches for a total distance of 3 miles at a cost of \$3,583.44.

An improvement to the ditching in the vicinity of Cataraqui Village was carried out and one culvert was placed under a farm entrance at a total cost of \$36.10. This work was classed as construction.

Summary

All charges included in the following totals for work done in the Township of Kingston, cover only pay sheets for men and teams and accounts for material used in construction and maintenance of the road for the period stated.

Construction

	<i>Total Expenditure.</i>	<i>Cost to Township.</i>	
Ditching and culvert	\$36 10	\$10 83	\$10 83

Maintenance

	<i>Total Expenditure.</i>	<i>Cost to Township.</i>	
Applying broken stone and rolling	\$3,768 94	\$1,130 68	\$1,130 68
Total Cost to Township ...			\$1,141 51

II.—PROVINCIAL HIGHWAY FROM PRESCOTT TO OTTAWA

Statement of Expenditure on the Provincial Highway during the period August 15th, 1918, to January 31st, 1919, in

EDWARDSBURG TOWNSHIP

The section of the road in this township was found to be in a worn out condition and to make it fit for traffic it was necessary to do a great deal of cleaning out of old ditches and culverts, cutting brush etc., and to patch and re-surface a great deal of the road.

The road was shouldered up and ditches dug over a length of 2,300 feet.

Old ditches were cleaned out and opened for a length of 6,920 feet. Also six culverts were repaired and cleaned out. Holes were filled with stone and the surface patched over 34,300 feet of road, and a new surface of stone was applied over a length of 11,070 feet. Considerable dragging was also done over parts of this road to keep the surface rounded up and fit for traffic.

Summary

All charges included in the following totals for work done in the Township of Edwardsburg, cover only pay sheets for men and teams and accounts for materials used in the construction and maintenance of this portion of the road during the period stated

Construction

	<i>Total Expenditure.</i>	<i>Cost to Township.</i>	
Earthwork	\$10 80	\$3 23	\$3 23

Maintenance

	<i>Total Expenditure.</i>	<i>Cost to Township.</i>	
Earthwork	\$113 90	\$34 17	
Surfacing	1,635 19	490 56	
Culverts	23 10	6 93	
	<u>\$1,772 19</u>	<u>\$531 66</u>	\$531 66
Total Cost to Township ...			\$534 89

Statement of Expenditure on the Provincial Highway during the period August 15th, 1918, to January 31st, 1919, in

OXFORD TOWNSHIP

The road in this township was in parts very narrow, requiring widening, and shoulders were broadened out with field stone to the full width of 30 feet over a length of 8,800 feet. The cost of this work was \$1,433.53. This amount also included clearing and brushing at the sides of the road for a distance of 5,100 feet. The road surface was improved near station 1410, for a distance of 1,100 feet by levelling up with gravel.

The road surface was in very bad condition requiring a new course of gravel for a length of 10,750 feet, this course in general being eight to ten inches thick. Patching and filling of holes was also carried out over 7,100 feet. A total length of 3,400 feet of ditch was deepened and opened out to improve the drainage, and minor repairs were made to culverts and guard rails.

Considerable dragging was also done throughout this period to keep the road fit for traffic.

Summary

All charges included in the following totals for work done in the Township of Oxford, cover only pay sheets for men and teams and accounts for material used in the construction and maintenance of this portion of the road during the period stated.

Construction

	<i>Total Expenditure.</i>	<i>Cost to Township.</i>	
Earthwork	\$948 87	\$284 66	
Clearing Brush	484 66	145 40	
	<u>\$1,433 53</u>	<u>\$430 06</u>	\$430 06

Maintenance

	<i>Total Expenditure.</i>	<i>Cost to Township.</i>	
Road Surface	\$3,314 45	\$994 34	
Culvert Repairs	43 85	13 14	
Guard Rail Repairs	8 45	2 54	
Clearing Ditches, etc.	48 83	14 65	
	<u>\$3,415 58</u>	<u>\$1,024 67</u>	\$1,024 67
Total Cost to Township ..			<u>\$1,454 73</u>

Statement of Expenditure on the Provincial Highway during the period August 15th, 1918, to January 31st, 1919, in

NORTH GOWER TOWNSHIP

The road through this township was in places very narrow and the sides grown up with brush and small trees. The road surface was in very bad shape. Permanent construction work was done in building the fill across Cranberry Creek at a cost of \$194.45.

The road was maintained and made fit for traffic by the cutting of brush along the sides of the road for a distance of 12,200 feet; it was also widened for a length of 2,700 feet. The surface was patched and holes filled and the road dragged for a distance of 18,500 feet, while new gravel and stone about 8 inches thick was put on the road for a distance of 10,300 feet.

Summary

All charges included in the following totals for work done in the Township of N. Gower, cover only pay sheets for men and teams and accounts for materials used in the construction and maintenance of this portion of the road during the period stated.

Construction

	<i>Total Expenditure.</i>	<i>Cost to Township.</i>	
Earthwork	\$194 45	\$58 33	\$58 33

Maintenance

	<i>Total Expenditure.</i>	<i>Cost to Township.</i>	
Road Surface	\$1,034 05	\$310 21	
Cutting Brush, Cleaning Ditches, etc.	288 90	86 67	
	<hr/> \$1,322 95	<hr/> \$396 88	<hr/> \$396 88
Total Cost to Township ...			<hr/> \$455 21

Statement of Expenditure on the Provincial Highway during the period August 15th, 1918, to January 31st, 1919, in

NEPEAN TOWNSHIP

The road through this township was in many parts without foundation, and the drainage being imperfect, it was impossible to keep the surface in shape. Permanent foundations were built of field stone for 4,200 feet of road, though in some places this could not be made the full width of road as fences were too close together. Wherever stone was applied the roads were ditched sufficiently to carry away surface water. The cost was \$590.25.

The road surface was repaired over a length of 12,200 feet by filling holes and dragging, while a complete coat of new gravel was applied over a distance of 4,200 feet.

One temporary culvert was put in and two culverts were repaired and guard rails erected.

Summary

All charges included in the following totals for work done in the Township of Nepean, cover only pay sheets for men and teams and accounts for materials used in the construction and maintenance of this portion of the road during the period stated.

Construction

	<i>Total Expenditure.</i>	<i>Cost to Township.</i>	
Earthwork	\$590 25	\$177 07	\$177 07

Maintenance

	<i>Total Expenditure.</i>	<i>Cost to Township.</i>	
Road Surface	\$651 27	\$195 36	
Ditches, Culverts and Guard Rails	94 60	28 40	
	<hr/> \$745 87	<hr/> \$223 76	<hr/> \$223 76
Total Cost to Township...			<hr/> \$400 83

III.—PROVINCIAL HIGHWAY FROM HAMILTON TO QUEENSTON.

The Hamilton-Queenston Provincial Highway runs from the City of Hamilton to the Niagara River at Queenston. From Hamilton easterly it is a continuation of Main Street and follows that street to the junction with what is known as the Stoney Creek Road, about a mile east of the Village of Stoney Creek. Through the County of Lincoln, it has been known for years as the Queenston-Grimsby Stone Road.

The following is a brief report of the expenditure made by the Department from August 15th, 1918 to January 31st, 1919.

BARTON TOWNSHIP

From Hamilton City limits to the Saltfleet line no work was done during the fall and winter. The surface is earth and little can be done on it until the spring.

SALTFLEET TOWNSHIP

From the Barton line easterly to the intersection with the Stone Road, there was no work done during the season. From this latter point to the Grimsby line the surface was rough in many places with a wide road surface and shallow side ditches.

Earthwork

Ditches were excavated on the permanent line and to a temporary grade at various points as required for proper drainage. About 1 mile of the road was thus drained by ditches on both sides and an additional 1,350 feet of ditch was excavated on the north side to relieve the drainage. Over a length of $2\frac{3}{4}$ miles the sod was removed in the fall and during the winter in order that the ground might be ready for ditching when the frost came out. The total cost of this work was \$1,808.30.

Culverts

Five entrance culverts were laid at points where the ditching had been done. Some of these are of extra length in order to provide access to the stopping places of the Hamilton-Grimsby and Beamsville Electric Railway which parallels the road across the township. The total cost of entrance culverts, including tile still on hand, amounts to \$246.75.

Road Surface

Early in the fall a roller was used to scarify $2\frac{3}{4}$ miles of the road for a width of 16 feet. Of this $1\frac{1}{2}$ miles was surfaced with new stone and screenings and rolled; 1 mile was patched with new stone where necessary, but was not rolled; and $\frac{1}{4}$ mile was resurfaced, but not rolled. The road across the entire township was dragged several times with a tractor grading outfit and a considerable amount of patching of small holes was done as necessity arose. The cost of this work has been charged to maintenance and amounts to \$5,259.14.

Summary

All charges included in the following totals for work done in the Township of Saltfleet, cover only pay sheets for men and teams, and accounts for material used in the maintenance and construction of the road, for the stated period.

Construction

	<i>Total Expenditure.</i>	<i>Cost to Township.</i>	
Earthwork	\$1,808 30	\$542 49	
Tile draining and culverts.	246 75	74 02	
	<hr/> 2,055 05	<hr/> \$616 51	\$616 51

Maintenance

	<i>Total Expenditure.</i>	<i>Cost to Township.</i>	
Surfacing	\$5,259 14	\$1,577 74	\$1,577 74
Total Cost to Township...			<hr/> \$2,194 25

NORTH GRIMSBY TOWNSHIP

From the Saltfleet line to Grimsby Village, the surface was very rough and full of holes. From the village for about 1 mile west, the grade was wide and well crowned; from here to the Saltfleet line it was narrow. From Grimsby Village east the surface was uneven and the grade narrow, and little or no provision for side drainage existed. The Hamilton-Grimsby and Beamsville Electric Railway runs on the south side of the road across the township and in some places is so close to the road that it is difficult to obtain the standard 30 foot grade and provide for side ditches.

Earthwork

Temporary ditches have been constructed on both sides of the road over a length of $1\frac{1}{4}$ miles. Ditches on one side for a distance of 2 miles were also excavated and the material used to build up the shoulders of the road, a surplus being drawn away. No heavy hill or bank cutting was encountered in any part of the township. The total cost for earthwork under construction is \$2,021.60.

Culverts

Six 18-inch vitrified pipe entrance culverts were installed at a cost of \$141.75. Sixteen existing culverts were cleaned out under maintenance at a cost of \$21.00.

Road Surface

Early in the fall the road was dragged across the township and during the winter whenever necessity arose the dragging was repeated. In the west end of the township 280 yards of the road were scarified, graded, new stone and screenings added and the surface rolled. Over a length of 2 miles crushed stone and screenings were applied to a width of 16 feet, but the roller was not used. One and one-half miles were surfaced and patched where necessary. The total cost of surface maintenance was \$2,971.25.

Summary

All charges included in the following totals for work done in the Township of North Grimsby, cover only pay sheets for men and teams and accounts for materials used in the maintenance and construction of the road, for the period stated.

Construction

	<i>Total Expenditure.</i>	<i>Cost to Township.</i>	
Earthwork	\$2,021 60	\$606 48	
Bridges and Culverts	141 75	42 52	
	<hr/> \$2,163 35	<hr/> \$649 00	\$649 00

Maintenance

	<i>Total Expenditure.</i>	<i>Cost to Township.</i>	
Earthwork	\$1 20	\$0 36	
Bridges and Culverts	21 00	6 30	
Road Surface	2,971 25	891 37	
	<hr/> \$2,993 45	<hr/> \$898 03	\$898 03
Total Cost to Township			<hr/> \$1,547 03

CLINTON TOWNSHIP

From the Grimsby line to the Village of Beamsville, the road surface was full of holes, the grade was narrow, the alignment poor, and there were no ditches. From Beamsville east for about 1 mile the same conditions existed, but from this point to the South line the surface was in excellent condition, the grade was fairly wide, but there were no ditches.

Earthwork

On the south side of the road across the township there are comparatively high banks which necessitate the removal of a large amount of earth in order to provide ditches. On the north side this condition does not exist and ditches can be excavated at comparatively small cost. Over a considerable length of the road the installation of ditches necessitates the cutting into high banks to a depth of from 6 to 12 feet. Ditches have been excavated on the permanent line and to temporary grade on both sides of the road over a length of $3\frac{1}{4}$ miles and on one side only for a total distance of $1\frac{1}{4}$ miles. The total cost of this work amounts to \$1,659.85, all chargeable to construction.

Road Surface

The road across the township was dragged several times in the fall and winter, over a length of about 400 yards past the Aviation Camp, east of Beamsville, the road as surfaced and rolled to a width averaging 16 feet. Where necessary, defects in the surface have been patched with stone and screenings. The total cost of surface maintenance for the above work is \$2,231.53.

Guard Rails

Necessary repairs to guard rails were performed at a cost of \$3.70, chargeable to maintenance.

Summary

All charges included in the following totals for work done in the Township of Clinton, cover only pay sheets for men and teams and accounts for materials used in the maintenance and construction of the road for the period stated.

Construction

	<i>Total Expenditure.</i>	<i>Cost to Township.</i>	
Earthwork	\$1,659 85	\$497 95	\$497 95

Maintenance

	<i>Total Expenditure.</i>	<i>Cost to Township.</i>	
Road Surface	\$2,231 53	\$669 46	
Guard Rail	3 70	1 11	
	<u>\$2,235 23</u>	<u>\$670 57</u>	<u>\$670 57</u>
Total Cost to Township ..			\$1,168 52

LOUTH TOWNSHIP

Between Vineland, at the western boundary of the township, and Jordan Village, 1.59 miles, a tar macadam surface had been constructed prior to the road being designated as a Provincial Highway.

Between Jordan and the east side of the Fifteen-mile Creek, 3.42 miles, the surface was rough and the grade narrow. The road is on a side hill for the greater part of the distance and ditches had not been constructed on a portion of this section.

Between the east side of the Fifteen-mile Creek and the Grantham line, 1.58 miles, the surface had recently been renewed with waterbound macadam and was in good condition. The drainage was poor, but the grade was almost of the width required for the Provincial Highway.

Earthwork

Between Vineland and Jordan the ditches and gutters were cleaned out, ditches leading to the road opened and the grade slightly widened just west of Jordan. Between Jordan and the Fifteen-mile Creek ditches were constructed on the south side on the permanent line and to a temporary grade for a distance of approximately 2 miles. Two outlet ditches were opened and high banks were cut down and ditches excavated at two points. The total cost of the earthwork was \$1,391.85.

Culverts

Five 18-inch vitrified tile entrance culverts were installed in their permanent locations and two temporary plank culverts erected. A charge of \$134.00 is made for two 18-inch corrugated pipe culverts which have not been installed, but are held in readiness for replacing some culverts which are in poor condition and might become blocked at any time before they could be replaced by permanent structures.

Road Surface

For a total distance of about 1½ miles the road received a coating of crushed stone and screenings. A short stretch of this was consolidated with the roller, but the greater portion of it was unrolled as the work was undertaken in cold weather. Prior to the application of the stone the road was dragged with the heavy grader and tractor through the entire township, a distance of 6.59 miles. The cost of maintaining the surface by dragging and laying stone was \$4,241.50. There was no charge for construction on this part of the work.

Guard Rail

A short guard rail was erected on the south side of the road at the small fill and the erection of 1,600 feet of guard rail on the east of Jordan Hill was commenced, but not completed. The cost of labour so far on these was \$173.67.

Summary

All charges included in the following totals for work done in the Township of Louth, cover only pay sheets for men and teams, and accounts for materials used in the maintenance and construction of the road, for the stated period.

Construction

	Total Expenditure.	Cost to Township.	
Earthwork	\$1,391 85	\$417 56	
Culverts	142 95	42 88	
Guard Rail	173 67	52 10	
	<hr/>	<hr/>	
	\$1,708 47	\$512 54	\$512 54

Maintenance

	Total Expenditure.	Cost to Township.	
Metalling, dragging and patrol	\$4,241 50	\$1,272 45	
Culverts, including two in stock	159 55	47 86	
Guard Rail	8 25	2 48	
	<hr/>	<hr/>	
	\$4,409 30	\$1,322 79	\$1,332 79
Total Cost to Township ...			<hr/>
			\$1,835 33

GRANTHAM TOWNSHIP

The western boundary of the township is approximately 1 mile west of the City of St. Catharines. This section had recently been surfaced by the County of Lincoln and was in very good condition. From St. Catharines East to the Welland Canal the grade is narrow, being bordered on the north by large trees for a part of the distance and on the south by a street railway track. The surface on this section was very rough and full of holes. Between the present canal and the Village of Homer the grade is wide, and the surface was in good condition. From Homer to the Niagara Township boundary the surface was fairly smooth, but the grade required widening.

Earthwork

Earth was removed from the shoulders of the road from St. Catharines to the eastern boundary of the township, 3.36 miles, thus widening the grade and providing facility for water to run off. In two places high banks were cut down and the material was used for widening the grade at adjacent gulleys. From St. Catharines to Homer, 1.4 miles, temporary ditches were excavated and the grade widened. The total cost of earthwork and ditching was \$1,499.45.

Culverts

A total of 33 entrance culverts were installed and one 18-inch tile was embedded in concrete under the road opposite Victoria Lawn Cemetery. Two lines of tile were laid to a catch-basin at Hartzell Road and two lines were installed at a cross road in Homer to carry the water under the walk. The grating of a catch-basin at the St. Catharines eastern limits was raised to conform to the grade of the road. The total cost for materials and labour for culverts was \$415.05 and for tile and installation \$4.92. Fifty-one outlet ditches were cleaned and opened and 12 culverts were cleaned out. This work is chargeable to patrol.

Road Surface

The road was surfaced with stone under maintenance for a length of 450 yards, the greater part of this work being done immediately east of St. Catharines. Where paving was not required, but heavy patching was necessary, this was done and the surface between St. Catharines and Homer was placed in better condition. Prior to application of stone, the road was dragged throughout the length of the township, a length of 4.21 miles.

Summary

All charges included in the following totals for work done in the Township of Grantham, cover only pay sheets for men and teams, and accounts for materials used for the maintenance and construction of the road for the period stated.

Construction

	<i>Total Expenditure.</i>	<i>Cost to Township.</i>	
Earthwork	\$1,499 45	\$449 83	
Tile and pipe draining....	384 92	115 48	
Culverts	415 05	124 51	
	<hr/>	<hr/>	
	\$2,299 42	\$689 82	\$689 82

Maintenance

	<i>Total Expenditure.</i>	<i>Cost to Township.</i>	
Metalling, dragging and patrol	\$2 884 93	\$865 48	\$865 48
			<hr/>
Total Cost to Township ...			\$1,555 30

NIAGARA TOWNSHIP

Throughout the length of the township, the road surface was in fairly good condition but the grade required widening in order to bring it up to the cross section of the Provincial Highway. The character of the country leads itself well to drainage, but there were few suitable ditches at the sides of the road.

Earthwork

Work in this township was commenced late in the season and earthwork was confined to the widening of the grade. In order to do this a surplus of earth had to be removed from the sides of the road to adjacent dumps. Across two gulleys the grade was widened slightly with the earth taken from either side. This class of work was carried on over a length of $2\frac{1}{2}$ miles and is chargeable to construction, the cost being \$1,347.85.

Culverts

One entrance culvert was installed, chargeable to construction, and a small pipe culvert, with a plank catch-basin under the M. C. R. bridge east of St. Davids, was repaired. The cost of repairing the catch-basin was \$1.80 and the cost of the entrance culvert with the tile for the catch-basin and the labour in installing them was \$78.75. Three large culverts were cleaned out and 80 small outlet ditches were opened, this work being charged to patrol.

Road Surface

The road surface for the entire length of the township, 5.5 miles, was dragged with the grader and as necessity arose this operation was repeated over small lengths. The total cost of this work, chargeable to maintenance, was \$692.90.

Summary

All charges included in the following totals for work done in the Township of Niagara, cover only pay sheets for men and teams and accounts for materials used in maintenance and construction of the road for the period stated.

Construction

	<i>Total Expenditure.</i>	<i>Cost to Township.</i>	
Earthwork	\$1,347 85	\$404 35	
Bridges and Culverts	78 75	23 63	
	<hr/>	<hr/>	
	\$1,426 60	\$427 98	\$427 98

Maintenance

	<i>Total Expenditure.</i>	<i>Cost to Township.</i>	
Road Surface	\$692 90	\$207 87	
Catch-basin	1 80	54	
	<hr/>	<hr/>	
	\$694 70	\$208 41	\$208 41
			<hr/>
Total Cost to Township ..			\$636 39

All of which is respectfully submitted.

GEO. HOGARTH,
Chief Engineer

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ANNUAL REPORT

OF THE

Department of Public Highways

ONTARIO

1919

PRINTED BY ORDER OF
THE LEGISLATIVE ASSEMBLY OF ONTARIO



TORONTO:

Printed by CLARKSON W. JAMES, Printer to the King's Most Excellent Majesty

1921



On Hamilton, Brantford Section of Provincial Highway

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To His Honour LIONEL H. CLARKE,

Lieutenant-Governor of the Province of Ontario.

MAY IT PLEASE YOUR HONOUR:

I herewith beg to present for your consideration the annual report of the Department of Public Highways, relating to Highway Improvement in the Province of Ontario.

Respectfully submitted,

F. C. BIGGS,

Minister of Public Works and Highways.

ANNUAL REPORT OF THE Department of Public Highways

Report of the Deputy Minister

HONOURABLE F. C. BIGGS,
Minister of Public Works and Highways,
Ontario.

SIR,—Road improvement in 1919, particularly that for which county councils are responsible under the Highway Improvement Act, made apparent the more favourable influence of Peace conditions. Various counties have taken steps toward more efficient organization, and larger appropriations were made in numerous cases. Still further advances may be anticipated for the ensuing year. With the establishment of a system of county roads in Peterborough, every county is now operating under the Highway Improvement Act.

I COUNTY ROADS

The Highway Improvement Act was initiated in 1901, when an appropriation of \$1,000,000 was made with a view to aiding a limited amount of construction: the grant in each case being one-third of the county expenditure. The first counties to pass the necessary by-laws were Simcoe and Wentworth, which were adopted in June, 1902, and November, 1902, respectively.

By a process of evolution, this Act, which provides for county road systems of leading market roads, has been placed on a permanent and satisfactory basis. Counties now receive from the Province 40 per cent. of expenditure for both construction and maintenance, and for the more important roads, 60 per cent. The co-operation of cities has also been secured in the construction and maintenance of the leading roads radiating from the cities under a system of Suburban Roads.

The total length of county road systems in 1919 amounted to 9,953 miles. (This mileage will be lessened when the complete system of Provincial Highways is established). Expenditure on county roads in 1919 was as follows:

	Total Expenditure.	Provincial Grant.
Maintenance.		
Provincial County Roads	\$585,992 58	\$351,595 56
County Roads	1,160,971 84	464,446 11
Total Maintenance	\$1,746,964 42	\$816,041 67
Construction.		
Provincial County Roads	\$1,689,864 56	\$1,013,918 75
County Roads	4,022,390 50	1,608,956 26
Deferred Payments	2,683 13	844 23
Total Construction	\$5,714,938 19	\$2,623,719 24
Summary.		
Total Maintenance	\$1,746,964 42	\$816,041 67
Total Construction	5,714,938 19	2,623,719 24
Total Expenditures	\$7,461,902 61	\$3,439,760 91

The work on which the foregoing expenditures for construction were made included the following:

Grading		166.52 miles
Gravelled surface	76.97 miles	
Waterbound macadam	151.17 "	
Cement concrete	11.60 "	
Bituminous penetration	30.80 "	
Asphaltic concrete	1.31 "	
Total surfaced		271.87 miles
Bridges over 10 feet span	163	
Pipe and tile culverts	1,406	
Other culverts	319	

Among the larger road improvements effected during the year, indicating the accumulating benefits of county road organization may be mentioned the following works:

A concrete pavement, 18 feet wide, on the Front Road in Essex County, 3.5 miles in length from Ford City easterly, and costing \$105,000. Also, Huron Line,



Lincoln County Road

Three-inch tar penetration surface on six-inch broken stone foundation sixteen feet in width.

a concrete pavement 18 feet wide, one mile in length, from Town of Sandwich southerly, and costing \$29,000.

A concrete pavement, 16 feet wide, on the Elmira Road, in Waterloo County; 1.4 miles in length from St. Jacobs southerly, and costing \$21,690, including five concrete culverts.

The Tansley Bridge over the Twelve Mile Creek in Halton, on Dundas Street, in the Township of Nelson, was erected at a cost of approximately \$115,000. This bridge has a maximum height of 98 feet above the creek bed, concrete abutments and four piers, has a steel superstructure 542.5 feet in length, and concrete floor 20 feet in width.

In Lanark County a bridge was completed over the Mississippi River at Ferguson's Falls, consisting of five steel spans, each 42½ feet long, with concrete

retaining wall, at a cost of \$21,000. Also in the same county, under the Smith's Falls Suburban Area Road Commission, about 2 miles of macadam road was built with metal 16 feet in width, twelve culverts and two bridges, at a cost of \$27,000.

Adjacent to the Town of Lindsay, the County of Victoria built $1\frac{3}{4}$ miles of asphaltic concrete pavement on a concrete foundation, 16 feet in width.

In the United Counties of Prescott and Russell, on the Ottawa-Point Fortune Road, there was built over four miles of bituminous penetration surface on a macadam base. With pavement 16 feet wide and twenty-nine concrete culverts, the expenditure was \$110,000. Elsewhere in these counties, water-bound macadam roads were built aggregating ten miles in length.

Near Sydenham, in Frontenac, a grade reduction through rock was carried out, and two miles of broken stone road constructed.

In Elgin an important work of grade reduction is in progress on what is known as Springer Hill, between Aylmer and Tillsonburg, including the construction of a 40-foot concrete culvert.

On the road from Kincardine to Tiverton in Bruce County, substantial construction is in progress, seven miles having been graded and widened, and five miles surfaced with crushed gravel. The work included fifty-one concrete culverts and three bridges.

Easterly from Wallaceburg, on the River Road, in Kent County, half a mile of concrete road was built.

One mile north of Markdale, on the Toronto-Owen Sound Road, the County of Grey made substantial progress in grade elevation through a swamp, in which exceptional difficulty has arisen.

Norfolk County undertook the construction of bituminous penetration roads of a substantial type in the village of Port Rowan, and adjacent to the Town of Simcoe.

The Suburban Area Commission of Brantford built nearly a mile of concrete pavement; as did the Suburban Area Commission of St. Catharines.

Lincoln County, in a series of sections, constructed in all over sixteen miles of bituminous penetration on broken stone base, the paved surface being 16 feet wide; also seven miles of broken stone on rubble foundation, ready for the bituminous surface.

Haldimand County carried out a substantial amount of construction, including a water-bound surface $12\frac{1}{2}$ miles in length on the Caledonia Road between Jarvis and Wentworth County; nearly five miles of macadam in the vicinity of Selkirk; $3\frac{1}{2}$ miles from Cayuga westerly, and $2\frac{1}{2}$ miles of bituminous penetration in the Village of Caledonia.

York County built nearly seven miles of bituminous penetration, and seven miles of water-bound macadam, with from 15 to 18 feet in width of metal surface.

II

PROVINCIAL HIGHWAYS

The Provincial Highway System on December 31st, 1919, amounted to 422 miles and, with the exception of sections in urban municipalities, comprised the main road from London via Ingersoll, Woodstock, Paris and Brantford to Hamilton; from Hamilton via Grimsby and St. Catharines to the Niagara River at Queenston; from York County (River Rouge) easterly, following the main road along Lake Ontario and the River St. Lawrence to the Quebec Boundary; and

from Prescott to Ottawa. These roads traverse the oldest and most populous portions of the Province, and may be expected to carry the heaviest of inter-urban traffic likely to develop on any continuous route. Special care therefore is being given to preliminary construction.

Expenditure on this work amounted to \$1,244,002.29 for construction and to \$94,689.76 for maintenance in addition to sundry general expenditures.

First effort on the Provincial Highway has had in view the development of a road continuously safe and reasonably passable for traffic. Advantage was taken of local conditions as far as possible, to utilize existing gravel and broken stone sections; and work was hastened on intervening sections to grade them, and provide at least a single track of metal. As a result, and within a very short period of actual labour, much improved traffic conditions have resulted.



Waterloo Provincial County Road.

Seven-inch cement concrete pavement, sixteen feet in width.

York County to Whitby

This section commencing at the Rouge River, has been one of the most difficult and expensive with which the Department has had to deal. Much earthwork has been necessary to produce satisfactory grades, to widen narrow portions at old culverts and bridges, and provide adequate drainage. The soil of the district is not favourable to road building, being generally a clay with many springs and planes of seepage, particularly on the hills, and drainage has therefore been given careful attention. Very little gravel of a suitable kind was available locally.

A railway siding and storage yard for stone has been provided at Pickering Village. During the past winter, stone was received at this yard, and to take advantage of available labour at that period, much of the material was teamed and spread on the road. Temporary inconvenience will no doubt be caused until this stone has been consolidated, but scarcity of labour makes it necessary to adopt every reasonable expedient to hasten the work.

When this section of the highway was assumed by the Department on August 21st, 1917, dangerous conditions existed at many points. Culverts and bridges were, as a rule, old wooden structures of insufficient width, and the approaches to them were narrow. All these structures have been replaced or are in process of renewal; and the approaches has been widened. At the River Rouge a very winding, narrow section existed, about three-quarters of a mile in length, with obstructed vision and dangerous turns. A new steel bridge on concrete foundations is in process of erection, with safe and adequate approaches. It is anticipated that this bridge will be opened for traffic in July, 1920.

At Pickering Village a new steel bridge 120 feet in length on concrete abutments has been erected. East of Pickering Village, what is locally known as Eagle or Post Hill has been lowered and widened, a work of much advantage to the road.

Earthwork and grade reduction has still to be done at the easterly end of the Rouge Hill, in the vicinity of Dunbarton Village, and at Pickering Village, but only of minor extent. The greater portion of the road to Whitby has been ditched, so that comparatively little earthwork has still to be done, a condition which will greatly facilitate the further improvement of this road for more satisfactory traffic conditions.

Whitby to Belleville

This portion of the Provincial Highway traverses a gravel district, much more favourable to road improvement than the section from York County to Whitby. A gravel road has been developed, and traffic between these two points is now fairly well served, although much improvement can still be effected with a view to more permanent conditions. The usual plan has been followed of providing adequate drainage, constructing permanent culverts and bridges, widening approaches and reducing grades.

At Bowmanville three steel bridges have been built: 212 feet, 54 feet and 36 feet in length; one 40 feet long at Wilmott Creek; a 52-foot span at Gages Creek and one 26-foot span two miles east of Cobourg.

Two small deviations to avoid dangerous curves are now being made, one at the west side of the Town of Port Hope, and one at the west end of the Town of Cobourg.

A gravel surface has been maintained throughout, with special attention to drainage at points which at wet seasons of the year were formerly very bad or impassable. The widening of certain parts of this highway, notably between Bowmanville and Port Hope, Brighton and Grafton, has produced excellent results. At what is known as Roseberry Hill in Hope Township, during the past winter a very considerable improvement has been effected involving the moving of a large quantity of earth by steam shovel. A similar improvement is in progress one mile west of Oshawa and Bowmanville Town. Between Trenton and Belleville, a series of small concrete bridges were built, notable for the difficulty in obtaining foundations in wet and soft situations.

Belleville to Napanee

As assumed by the Department on June 27th, 1919, this portion of the Provincial Highway was, in many portions, in a very inferior condition. Passing through a limestone district, immediate improvement has not been so rapid as in sections where gravel is plentiful, as the production of broken stone is necessarily a slower and usually more expensive process.

From Belleville to a point $1\frac{1}{4}$ miles east of Shannonville, broken stone from the Point Anne Quarries was applied in a single track to provide immediate service and to keep the road passable under autumn and spring conditions.

At Shannonville, a considerable deviation is being made in order to better the alignment and straighten the route. This work now under contract is proceeding rapidly.

From the end of the stone to Marysville, gravel has been applied, and the road straightened and widened. From Marysville south to Deseronto much earth-work was necessary, also a new bridge over Sucker Creek, 45-foot span. This part under contract is nearing completion. Hill reduction, widening and alignment have produced much improvement on this section of the highway. From Deseronto easterly to Napanee a marked improvement has been effected by the construction of a mile of heavy rubble base with macadam surface. For $2\frac{1}{4}$ miles stone was spread about 12 feet wide.

Another deviation, eliminating dangerous curves is being made one mile east of Deseronto.

Twenty-one concrete culverts have been constructed varying in sizes from 3 x 2 to 6 x 4 openings. Many farm entrance culverts and side road culverts have been installed.

Napanee to Kingston

This section of the highway was built at one time in a substantial manner as a toll road, known as "The York Road" and has more recently been maintained as a county road, but was much in need of improvement and reconstruction. At Napanee a limestone hill is in process of reduction, the material being converted into broken stone for road purposes. A useful and permanent improvement will result.

In North Fredericksburg Township the road has been substantially built with a heavy rubble base and a macadam surface 20 feet wide, for a distance of three miles, and much material is available for a large amount of important work. Four concrete culverts varying from 18 inches in diameter to 16 feet span were built.

In Ernesttown Township, $3\frac{1}{2}$ miles of road has received a cobble base 18 feet wide, with a temporary gravel surface. In all, about eight miles has been either surfaced with gravel or patched with broken stone. The work of surfacing in Kingston Township is being handled by contract, together with the culverts. Much repair work has been undertaken and it is expected the surface will be completed in 1920. A new steel bridge, 45-foot span, with two sidewalks, and two culverts, 5-foot span have been built at Odessa.

Kingston to Gananoque

A limited amount of improvement only was possible on this section, owing to the comparatively late date in 1919 upon which work could be commenced, but betterment has been effected from Kingston across Barriefield Camp, including a short section of bituminous penetration. A contract has been awarded for widening and raising the grade at Long Grass Swamp, a work urgently needed as existing conditions are very unsafe.

Ditching, grading and widening the roadbed has been carried out on seven miles of the road. At Barriefield and Gananoque ends, this work was done through a rock country. Two crushing outfits are located on this section and $11\frac{1}{2}$ miles of roadway has been surfaced with crushed stone 18 feet wide, and $11\frac{1}{2}$ miles

9 feet wide; the rest of the section has been patched with gravel or broken stone. Seventy-two pipe culverts were installed. A contract is now in progress for constructing the remaining culverts in Leeds Township, west of Gananoque, and tenders are being obtained for the grading of this section.

Gananoque to Brockville

This section included some very inferior road, which had received little previous improvement, due in part to the character of the country traversed, as it offers natural obstacles to road making such as local municipalities find difficulty in overcoming. Rock exposures, inferior drainage outlets, problems of re-location were involved. Substantial progress has been made, however, and through the Township of Leeds $2\frac{1}{2}$ miles of road has been gravelled, the shoulders graded, ditches cleaned, and culverts repaired. The road surface through Lansdowne



Repair—Cutting Shoulder.

Sod and earth thrown to roadside.

Township was in fair condition. For three miles the shoulders were graded, and a light coat of gravel placed on the surface.

Through the Township of Escott, the drainage, grades and alignment were bad. Much improvement has been done to each despite the outcrop of granite rock, which covers practically the whole distance. Two miles of road were surfaced with crushed stone, 9 feet wide; and four miles of road were repaired.

At Mallorytown half a mile of road was ditched and the surface repaired with stone.

In Elizabethtown Township, west of Brockville, some heavy grading was carried out to relieve steep grades and poor alignment. During the winter a large amount of field and quarry stone has been piled close to the road for crushing purposes.

On this entire section fifty-four pipe culverts were installed, one large concrete culvert and one 36-inch galvanized pipe culvert encased with concrete.

Brockville to Prescott

Until recently this was a toll road, but in 1918, prior to the designation of the Provincial Highway, was purchased from the company by the counties' council of Leeds and Grenville. Although an old macadam road, it is now in very inferior condition, and will require substantial improvement to serve the traffic between these two towns, a distance of ten miles. Work was commenced late in the season: however, three-quarters of a mile of road east of Brockville received a good coat of crushed stone. Some ditching and rock cutting was carried out. One concrete culvert was built, and from Maitland to Prescott, a distance of five miles, the road was surfaced with gravel.

Prescott to Cornwall

Following closely the shore of the St. Lawrence River, this portion of the Provincial Highway crosses outlets of numerous streams, and the rebuilding of many small bridges has been necessary before much progress could be made with grade and surface improvement.

Portions of this road from Johnstown to Cornwall are on canal banks, and are under the control of the Department of Railways and Canals.

Fieldstone is being largely used in this section. During the past winter, a considerable amount of material has been hauled to the road, and crushing is in progress. East and west of Cornwall, an effort has been made to meet the need for immediate betterment, and foundation has been laid about $1\frac{1}{2}$ miles in extent.

In Edwardsburg Township the roadbed was widened out to 30 feet for a distance of one mile, three-quarters of a mile of road was surfaced with gravel 12 feet wide, and three-quarters of a mile stoned 10 feet wide. A grading contract has been awarded which will straighten and reduce grades.

In Matilda Township eight miles of road were patched with gravel and broken stone, and one mile was given a base course of crushed stone. During the winter about 2,000 cubic yards of crushed stone was placed in a stock pile.

The road in Williamsburg Township was graded for a distance of seven miles. The road surface was patched and holes filled with broken stone.

In Cornwall Township the road for a distance of one mile received a cobble base 20 feet wide. During the winter about 3,000 cubic yards of fieldstone was hauled to stock piles for construction purposes. East of Cornwall the road was metalled for $1\frac{1}{2}$ miles 12 feet wide. One large concrete culvert 16-foot span was built in Osnabruck Township. One-fifth of a mile was widened and ditched. Several carloads of vitrified pipe have been delivered to the road and many pipe culverts have been installed. Sand was delivered to the site of many culverts during the winter ready for construction purposes. Three culvert contracts have been awarded and work commenced.

Cornwall to the Quebec Boundary

East of Cornwall, the Provincial Highway follows the St. Lawrence to the Quebec boundary east of Bainesville. Drainage conditions become somewhat difficult, particularly in the Townships of Charlottenburg and Lancaster. A bridge 225 feet in length will be erected at Lancaster Village. During the winter a considerable amount of fieldstone has been teamed and crushed for foundation purposes.

Five miles of roadway have been gravelled and the road has been patched on most of the section: also two miles has received a base course 15 feet wide, and is now being rolled.

Ottawa-Prescott Highway

This section of the Provincial Highway is one which connects the Capital of the Dominion with the main east and west route of the Provincial Highway, and also connects, by the Ferry from Prescott to Ogdensburg, with the highway system of the State of New York. Leaving Ottawa at the Dominion Experimental Farm, it follows closely for $14\frac{1}{2}$ miles the bank of the Rideau River, then traverses centrally the Township of North Gower, and crosses the Rideau at Becketts Landing, two miles north of Kemptville. From Kemptville, it passes through the Village of Spencerville, and connects with the St. Lawrence Highway three miles east of Prescott, at what was formerly the Village of Johnstown.

The completion of this road will undoubtedly be of great service in developing the rural district through which it passes, but will also provide the City of Ottawa with a route of much commercial value.

The greater part of this road has been graded from the St. Lawrence River to the Village of North Gower, while on several stretches north of that point, substantial grading has been done.



Maintenance.

Outfit for Applying Bituminous Materials in Maintenance Work.

A bridge 72 feet in length has been erected at Spencerville, and contracts have been let for a bridge 80 feet in length over the Jock River north of the Village of Manotick. Work of grading has been delayed, more especially in the vicinity of Ottawa, by failure of the contractor to construct culverts in the Township of Nepean, and it has been necessary to re-let this work.

A considerable amount of gravel was supplied to the road during the fall and winter of 1919-20; and crushed stone has been applied southerly from Ottawa two miles, and shorter lengths at other points. In all, 25 miles have received substantial surface covering of gravel or stone.

The original condition of this road was very inferior and much work is involved in producing a satisfactory foundation. The greater part of the right-

of-way was between 30 and 40 feet wide, the fence lines grown up with brush, and in many cases filled with field stone. Swamp conditions, boulder-clay hills, and inferior drainage outlets are also some of the difficulties being overcome.

Owing to the exceptional foundation conditions on this road, unequal settlement is to be anticipated for a period, and while the construction of a surface of a so-called "permanent" type would be a mistake at the present time, it is anticipated that a serviceable road will be produced from Ottawa to Prescott by the end of 1920; following which, more permanent surface construction can be carried on as foundation conditions permit.

Forty-one concrete culverts have been constructed with varying openings of 2 feet x 2 feet to 17 feet x 8 feet. Tenders have been called and contracts awarded for the remaining bridges and culverts.

Hamilton-Queenston Road

The Hamilton-Queenston Provincial Highway follows the route of the old military road that connected Queenston, on the Niagara River, with Grimsby, on Lake Ontario, and latterly was extended to the City of Hamilton. The Niagara



Repair—Patrolman at Work.

1. Applying stone to pothole after thorough cleaning.

escarpment follows the shore of Lake Ontario at a distance of from one to three miles from the Lake, the intervening country having a gradual slope to the north. It is this strip of the Niagara Peninsula that is famed as a fruit district, the greater part of the area being devoted to the growing of small and large fruits. The centre of the fruit belt is tapped by the Hamilton-Queenston Highway, which came under the control of the Department in August, 1918.

Traffic on this portion of the Provincial Highway is exceedingly heavy as it is the through road from points north and east of the City of Hamilton to the American frontier. It also constitutes a section of the direct route from Windsor and Detroit to Niagara Falls and Buffalo.

When assumed as a Provincial Highway this road had an old stone surface which had been constructed and maintained by the counties of Lincoln and Wentworth. Little attention had, however, been paid to drainage, owing to the fact that all funds available were required to maintain the surface for the heavy traffic.

The Department therefore undertook the construction of proper drainage, which, on account of the fact that the road lies across the natural slope of the country, necessitated the installation of adequate ditches on the south or uphill side for the entire length of the road and for a greater portion of its length on the north side. The drainage has been almost completed and a number of concrete culverts have been constructed.

Several miles of road have been brought to the final grade and a heavy foundation of waterbound macadam has been laid where the old surface was moved.

At a sharp corner known as Cape Horn, in Clinton Township, the high bank was cut back, the grade of the road raised, and a slightly banked curve constructed with the result that practically all danger due to the curve and to obstructed view has been eliminated.

During the summer of 1919 the road was oiled for its entire length and a coating of screenings applied over the oil. This eliminated the dust and improved the surface to a great extent.

Hamilton-London Provincial Highway

Commencing at the westerly limits of the City of Hamilton, the Provincial Highway follows the Dundas Road to Binkley Corners and from there the Ancaster Road to the City of Brantford. Passing through Paris it joins the old Governor's Road at a point about four miles west and continues through Woodstock, Ingersoll and Thamesford to London.

When assumed as a Provincial Highway by the Department in June, 1919, the roadway was narrow and uneven. A large grader pulled by a heavy steam tractor was used to round the surface, widen the grade and make temporary ditches. About forty miles of road were improved by this means.

In the vicinity of Princeton the roadway was narrow and rolling. About three miles of this was widened, the small hills cut down and light fills made. This work was done economically by wheel and drag scrapers as the soil was for the most part light sand. Immediately east of Thamesford a bank was cut back to improve the view and the earth removed was used to construct a curve in place of the sharp turn at the easterly approach to Thamesford bridge. Between Brantford and Paris, at several points the road was widened and the grade improved by using the earth to raise the road across small gulleys. At several points between Ancaster and Brantford, where the road ran through narrow cuts, the banks were cut back, the road widened and the grade raised in the immediate vicinity.

Between Woodstock and Ingersoll a considerable quantity of gravel was taken from pits owned by the Department and spread on the road. This was kept in shape by the use of a three-section drag and a first-class gravel road has been obtained. The same class of work was carried on easterly from the City of London, and between the City of Brantford and Cainesville, a large quantity of gravel being placed on the road.

III

PROVINCIAL HIGHWAY CONSTRUCTION

Certain factors should be clearly stated in order to determine the policy which should be followed with respect to the construction of Provincial Highways, and the various stages through which their development should pass.

(a) Highways should be built in proportion to the traffic over them.

(b) The need is not merely for a system of fully built highways ten years hence; but immediate service in a reasonable degree.

(c) Many of the routes which form the Provincial System have had more or less improvement, and are capable of a certain degree of restoration for immediate use.

(a) Building in Proportion to Traffic

The number and weight of vehicles passing daily over a given mile of highway is the gauge by which the design of a highway should be determined in respect of strength of foundation, durability of surface, width of surface, and other details of construction. An inexpensive gravel surface on a lightly travelled road may readily give better and more satisfactory service than will a concrete or asphalt pavement on a road of heavy traffic. Conversely, it may be a useless expenditure to build, at high cost, an asphalt pavement on a road which serves only a few vehicles daily.



2. Applying screenings.

A waterbound macadam road may be satisfactory for a road which carries horse-drawn vehicles only; but such a road wears out very rapidly under the traffic of motor vehicles; and for heavy motor traffic, a protective treatment of oil or tar is needed, or with heavier traffic, a concrete or heavy bituminous surface.

If the traffic of heavily loaded motor trucks is anticipated, the foundation of the road must be correspondingly strengthened, using a greater depth of stone, or a concrete foundation. While fast moving motor vehicles require a protected surface, it is the foundation which is disrupted by excessively heavy loads.

(b) Immediate Service

The best known highway systems of the Eastern States, such as those of New York, New Jersey, Connecticut or Massachusetts, have been under construction for a long term of years—a quarter of a century or more. They have been built in short sections, commencing at urban centres, and have been extended from year to year until the present connected systems have resulted.

Such a plan would be a severe test on the patience of the people of this Province, as the present need for a connected system of main roads throughout Ontario is urgently felt.

On the other hand, an endeavour to bring to completion for immediate use, fully paved, a lengthy system of main roads, is an undertaking that is not only prohibitive in cost, but does not recognize the value of time as a factor in road-building. The amount of plant, equipment and organization necessary for the immediate completion of pavements in long stretches is not available in the Province, while infinitely better results can be obtained by carrying on development no more rapidly than complete settlement of earth grades, and foundation can be obtained. The final settlement that takes place in a road bed cannot be produced by roller or other mechanical means; exposure to weather and wear under traffic are the only means of obtaining complete settlement. If a "permanent" surface is placed on a partially settled road bed, unequal settlement of the foundation must result; and when the foundation sinks, the surface must follow with disastrous results to the pavement.

(c) Restoration of Old Roads

The highways comprised in the Provincial System were in many cases old toll roads, or were formerly main county or township roads, had in some cases



3. Watering patch.

been well graded, and surfaced with gravel or broken stone. While in many instances, much deteriorated for lack of maintenance, nevertheless they may be repaired for present use by rapid and inexpensive methods. By cutting away high sod shoulders, raising the centre with a new application of gravel or stone, improving the drainage, and supplementing this with a system of patrol maintenance, a very marked improvement can be effected.

By first establishing a maintenance system over the Provincial Highways as a whole, and giving immediate service on a well-repaired system of roads, permanent construction can follow with least inconvenience to the public, and as rapidly as may be expedient.

Having the foregoing factors in view it is in general, a proper policy to follow, upon taking over Provincial Highways, to at once establish a system of repair which will restore the roads for immediate use. With this work, unimproved sections, the weakest links, are given first attention, to properly grade and drain them, and to provide a preliminary surface coat or foundation which will permit immediate use. Culverts are built, bridges are re-constructed, foundations

generally are strengthened, and the road, while being improved for immediate use, is consistently brought to a condition, as a foundation, that will sustain any form of surface that traffic may require. An adequate mileage of well-located, well-graded highways, with permanent foundation, culverts and bridges, with pavement as good as is consistent, having consideration to all factors, it is a broad and effective policy that will give the best results.

Class of Surface

Having produced a grade that is of adequate width, is well drained, is provided with permanent culverts and bridges, and is provided with at least a temporary surface, the construction of a surface that is adequate for traffic can be carried on as conditions permit. The use of the temporary surface by vehicles will do much to produce a well-settled foundation. The impatience for good roads has in many cases led to the construction of surfaces before the foundation was ready; and more financial loss and failure of pavements has resulted from this than from any other cause.

The surface which will be used on the Provincial System will not be of one class throughout, but will be varied according to traffic and local material available. Under present conditions at least, gravel of a good quality, if obtainable locally, will be employed where traffic is not heavy. Water-bound macadam will naturally be used where gravel is not available, but where crushed stone can readily be obtained. Asphaltic oil, or cold applications of tar will necessarily be employed in the treatment of gravel and water-bound macadam to prevent dust, or protect the surface where the limit of motor traffic is greater than these materials can economically resist. Under increasing traffic, there comes a stage where the cost of repair, or insufficiency of service, renders necessary a more substantial wearing surface than gravel or macadam, either without treatment or with light surface applications of oil or tar.

The more durable classes of surface ordinarily available include, broadly—
(a) Bituminous Macadam (or bituminous penetration); (b) Bituminous Concrete or ("Hot Mix"); (c) Cement Concrete.

The first of these, bituminous macadam, is a form of surface made by first following the process of building an ordinary macadam road; but into the top layer is poured hot tar or asphalt, penetrating to a depth of two or three inches. This is rolled and finished with a carpet coat of bitumen, and sand or stone chips. This form of construction has been largely used in England, where its success has been due in part to the fact that it is usually laid over old and well-settled stone foundations. Conversely, many failures on this continent have been due to the hasty attempt to produce earth grade, foundation and surface in one operation. Unequal settlement and failure of the surface has inevitably resulted.

Bituminous concrete is usually a carefully graded mixture of fine stone, sand and asphalt; all materials being heated before being mixed. Over a foundation of concrete or stone, this mixture is spread, while hot and plastic, and rolled to a depth of two to three inches, forming a highly protective and resistant wearing surface. By a very similar process, a cheaper mixture of fine gravel and asphalt is used in some of the New England States and will be tested in this Province.

Cement concrete as now commonly laid is composed of one part of Portland cement, one and one-half parts of sand and three parts of broken stone. Concrete of the most perfect type is necessary. The sand and stone must be clean and of the best grade, the cement should be rigorously tested. Mixing and all

manipulation must be complete and of the best workmanship. Work and materials which may be sufficient for concrete in its ordinary uses, cannot be accepted for concrete paving without extreme danger of failure. The marked success which has attended the use of concrete roadways can only be had by the closest attention to details in construction.

IV

WIDTH OF MAIN HIGHWAYS

Portions of the Provincial Highway where telephone, telegraph, power and electric railway lines are in existence or may be built, are being brought to standard widths of 86 to 90 feet where practicable. This applies only to the main lines of the system.

The majority of road allowances in Ontario were in the original surveys, placed at 66 feet; although some, particularly in Eastern Ontario, were surveyed as narrow as 40 feet.



4. Brooming binder into patch.

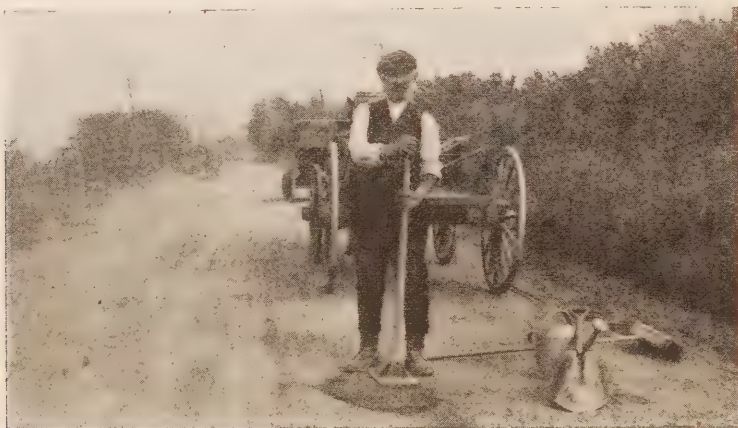
The width of highways was placed at 66 feet many years ago, and at a time when horse-drawn traffic only had to be considered. Under the original conditions, it was usually quite possible to grade and build a highway within 66 feet; and to maintain along it lines of shade trees.

Since that time, the telephone, telegraph and electric power lines, motor cars and motor trucks, have all found a place on the highway, in addition to horse-drawn vehicles. We find that trees are being mutilated and destroyed on the public highways, owing to the necessity of keeping the wiring free from contact with the trees. When trees come into contact with electric power lines, very dangerous conditions arise and deaths have been caused in numerous instances.

Most of the highways are supposed to be 66 feet in width, but we find this very seldom the case. Property owners have commonly built rail fences outside the 66 foot line, and wire or other fences have been later constructed outside of the rail fences. Only 11 per cent. of the existing highway from Ottawa to Toronto is 66 feet in width, the greater part being 54 or 56 feet wide and many portions much less.

It is very generally accepted that the Provincial Highway should be of such width that lines of trees can be maintained on it, and this is impossible on the widths of highway as they now exist. In many cases, the width of 86 feet is absolutely necessary where the cuts and fills are made. Throughout the system generally, the extra width of allowance reduces the cost of grading, provides additional earth where necessary, or a convenient area for disposing of excess material within the right-of-way.

Owing to the narrowing of the highway by property owners to widths varying from 35 to 56 feet, a large amount of fence moving is necessary in any case. The 86-foot right-of-way only requires two and one-half acres additional per mile, as compared with 66 feet. This means only between one-quarter and one-third of an acre for each one hundred acre farm fronting on the highway. The extra cost from this source has by some been over-estimated, as the cost of land required is comparatively small. Buildings seldom have to be moved; and in all cases interference with expensive structures is avoided.



5. Tamping patch.

The amount of traffic which grows up on a Provincial Highway makes foot-paths necessary for the safety of pedestrians; and a right-of-way only 66 feet in width is found to be too narrow for this purpose, as experienced on the Toronto-Hamilton Highway.

Weed cutting can be more conveniently carried out on a width of 86 feet, as the greater width facilitates the use of a mowing machine. Where the roadside between the ditch and the fence is narrow, and occupied by poles, it is commonly necessary to do the work by hand.

One of the advantages of the 86 foot width is in connection with snow roads, and the reduced cost of keeping them open in winter will be a very substantial return on the extra cost of widening. Where the road is only 66 feet in width and orchards exist along it, or where brush, shrubs, hedges, etc., grow along the fences, there is insufficient width to take care of snow drifts. On an 86-foot right-of-way this difficulty is almost entirely overcome, as drifts seldom reach the travelled portion of the road.

Having regard to the circumstances outlined, the requirements of telephone, telegraph and power lines, the desirability of maintaining trees along the Provincial

Highway, the need of foot-paths, the reduced cost of grading, the better facilities for drainage, the necessary expenditure in any event for widening the highway from present narrow conditions, the convenience and reduced cost of keeping snow roads open, the comparatively small area of land required for the extra width, all combine conditions which make a very strong case in favour of the 86-foot right-of-way.

The highway is not, as a rule, being widened through villages and towns for the reason that, as they are now built up, the cost would be too great. The difficulty is, in part, overcome in towns by using underground storm sewers in place of open ditches. This condition as it exists in towns, indicated that the greater width should be acquired in the open country now, as the cost will every year become greater because of new buildings and other improvements along the road.

The advantages to property owners in having their land situated on a highway of this description are obvious. Land values along this class of highway invariably



6. Repaired surface.

show decided increases, and their improvement by widening to 86 feet should have the co-operation of all property owners in their own interest. The immediate inconvenience is a very temporary one, and will quickly disappear through the development of much more satisfactory conditions.

V

TEMPORARY INCONVENIENCE

The main highways of the Province are involved in the Provincial System; and, carrying a large proportion of traffic, a maximum of inconvenience will temporarily exist while construction is in progress. Inconvenience to the travelling public, during the period of road construction, and during periods of extensive repair, is unavoidable. While works of grading, drainage, foundation construction, bridge and culvert building have been in progress, to the present time the Department, as far as practicable, and in an exceptional degree, has avoided lengthy detours. When the finishing of a macadam or final surfacing is in process, however, it becomes necessary to detour traffic; and this situation is one which drivers of vehicles must be willing to accept as essential and in the public interest.

During the first years of construction on the Provincial Highways, a considerable amount of misunderstanding is anticipated as to the objects and purposes of the work in its various details. Most users of vehicles appreciate the finished surface only, and are apt to be impatient with respect to the preliminary work. But good grades, good alignment, good foundation are the only permanent part of the work, are essential to durability of surface—and cannot be put under the surface after it is laid.

To correct a common misunderstanding, it may be further explained that comparatively moderate hills in many cases are cut, not to reduce the grade of the hill, but to widen the top for safety or for drainage, or to provide earth for widening the grade at the foot of the hill, as circumstances may require. The purpose of a multitude of such works is not apparent, without an understanding of the ultimate intention of the engineer. Material placed for foundation and left temporarily for settlement is often assumed by users of the road to be the final surface. From all such sources, misunderstanding has, and will continue to arise, until the public become familiar with the process of road-building as carried out on a substantial scale. When users of the roads in Ontario learn, as in other countries, that such situations are a necessary part of road development and maintenance, the work of highway construction throughout the Province will be facilitated.

VI

PROVINCIAL AID TO ROADS

Provincial aid to road improvement has, since 1901, been a matter of progressive evolution. The Legislature now in session has enacted most important amendments which should have a far reaching and beneficial influence on road conditions throughout the Province. This applies more especially to the assistance provided for township roads.

Under present legislation, roads of Ontario in respect of Provincial aid may therefore be classified and described as follows:

1. Township Roads; under the control of township councils, to which the Province contributes 20 per cent. of the cash expenditure. If the township appoints a road superintendent, the Province pays 40 per cent. of his salary. Statute labour is not eligible for subsidy; but failure to abolish statute labour does not debar the township from receiving 20 per cent. of the remaining cash expenditure.

To qualify for this grant, the township council must annually pass a by-law making their cash appropriation of township funds, and deposit a copy of the by-law with the Department of Highways.

2. County Roads; designated by county by-law and under the control of the county council.

- (a) County Roads generally, receive a Provincial subsidy of 40 per cent. for construction and maintenance.

- (b) Provincial County Roads receive a Provincial subsidy of 60 per cent. for construction and maintenance; are usually recommended in the first instance by the county council, but are subject to the special designation of the Minister of Highways.

- (c) County Suburban Roads are constructed and maintained in the proportions of 40 per cent. by the Province, 30 per cent. by the city, and 30 per cent. by the county; and are designated by and are under the management of a special

commission representing the city and county. When a Provincial County Road is included in a county suburban system, the Province contributes 60 per cent., the city 20 per cent. and the county 20 per cent.

3. Provincial Highways are designated by and are under the management of the Department of Public Highways.

(a) On Provincial Highways generally, the Province assumes 80 per cent. of the cost, and levies 20 per cent. on the county in which the work is situated.

(b) Provincial Suburban Highways adjacent to the cities, are designated by the Department, and the city is required to contribute 20 per cent. of the expenditure.

VII

DOMINION AID

The Dominion Government has set aside \$20,000,000 in aid of highway construction. This is apportioned among the Provinces according to population, Ontario's share amounting approximately to \$5,800,000. This is payable in the proportion of 40 per cent. as the work progresses. The grant is applied to construction only; and maintenance, machinery, bridges, subways, land and overhead expenditures are not eligible for subsidy. The Province is required to guarantee the proper maintenance of the roads for which a Dominion subsidy is received, so that the grant is limited to expenditure on Provincial Highways only.

SPECIAL AND DEPARTMENTAL REPORTS

Hereto attached as appendices, are the reports of the Engineer of Highways; with respect to Provincial Highways; the reports of the Inspecting Engineers of County Roads; the report of the Registrar of Motor Vehicles; the annual report of the Ontario Good Roads Association; together with regulations and other publications of the Department of Public Highways.

I have the honour to be, Sir,

Your obedient servant,

W. A. McLEAN,

Deputy Minister.

APPENDIX No. 1—

Statement of Work and Expenditure

County	Work Done During Year							Roads and Culverts
	Miles Graded	Miles Stoned	Miles Gravelled	Tile Drain Rods	Bridges	Pipe and Tile Culverts	Other Culverts	
Brant.....	3.10	{ Concrete .5 1.0 }	.....	442.42	3	39	3	\$43,159 48
Bruce.....				51.8	3	13	12	6,626 91
Carleton.....	12.50	5.	11.20	.....	3	25	6	65,957 91
Dufferin.....	.8	1.9	.....	21.8	4	83	5	15,612 92
Elgin.....	1.48	1.	5.28	122.	5	40	6	44,928 21
Essex.....		Concrete 4.75	.....	100.	9	3	5	146,089 68
Frontenac.....	2.50	2.	.....	.....	1	21	2	12,808 25
Grey.....					2		3	2,054 86
Haldimand.....	4.25		4.75 6.50	.....		47	7	43,046 13
Halton.....	10.25	5.	.....	.....	1	12	1	27,541 20
Hastings.....					5			8,985 82
Huron.....	.06	Concrete 4.67	.....	5	5	6	6	16,047 03
Kent.....	.72	.....	.....	1,676.	6	14	3	27,567 55
Lambton.....	6.03	1.	6.1	881.	7	22	6	23,380 81
Lanark.....	.5	6.	1.5	.....	1	11		55,979 75
Leeds and Grenville.....	5.5	{ Gran. 2.5 10.0 }	.25	242.	4	20	7	8,078 83
Lennox and Addington.....		2.	.....	.....	1	2		430,391 64
Lincoln.....	19.5	{ Concrete 1.33 Pen. Mac. 16.10 7.2 }	4.25	287.	3	363	4	8,857 24
Middlesex.....	.28			2,987.	3	13	2	11,440 16
Norfolk.....	1.12	Pen. Mac. 1.08	.....	787.	3	10	6	3,916 01
Northumberland and Durham.....			7.	.....			5	8,887 01
Ontario.....	.17	.60	.56	.....	4	52	4	57,380 80
Oxford.....	13.08		4.25 .46	5,132.		37		20,372 88
Peel.....	4.38		.83 1.88	.....		48		82,334 94
Perth.....		{ Stone Tarvia Mac. Cement 1.46 }	7.83	1,554.		8	1	
Peterboro.....				.....	4			
Prescott and Russell.....	3.37	{ Asp. Mac. 1.25 9.75 }	.....	.....	1	25	3	89,886 71
Prince Edward.....	.38	Rock .87	.50 28.	.....	1	10		15,029 74
Renfrew.....	5.25	.19	.47 150.	.....	5	40	2	44,041 98
Simcoe.....	.06	.06	.....	.....	8	16	7	7,563 77
Stormont, Dundas and Glengarry.....			26.47	.....	3		10	87,327 10
Victoria.....		Asp. Concrete .56	1.5 21.8	.....	2	13	2	799 74
Waterloo.....	.25	{ Concrete .37 2.25 }	.....	.....	3	2	3	14,012 32
Welland.....	22.		1.95	.....		20	27	26,250 30
Wellington.....	.18		1.25	.....	13	27	5	10,277 61
Wentworth.....	11.		3.50 45.4	.....	1	21	7	45,921 67
York.....	3.14	{ Bit. Mac. 3.95 5.41 }	1.95	.....	6	41	48	191,425 63
Totals.....	131.85	* 143.49	57.78	14,529.22	123	1,105	208	1,703,982 62

* Includes—

111.34 miles Stone.

8.50 do. Concrete and Cement.

23.09 do. Bituminous Penetration.

.56 do. Asphaltic Concrete.

SUMMARY, 1919

on County Road Construction

Approved Expenditure for Year

Bridges	Machinery and Repairs	Special Grants to Towns and Villages	Purchase of Toll Roads and Gravel Pits	Superintendence	Total Approved Expenditure on Construction	Total Approved Expenditure on Maintenance	Total Approved Expenditure	Government Grant 40 per cent.	Disallowed
\$13,428 41	\$19,948 11	.....	\$2,300 00	\$3,175 02	\$82,011 02	\$15,231 99	\$97,243 01	\$38,897 40	.....
3,121 53	16,798 06	\$2,089 56	.....	3,136 72	31,773 78	29,282 07	61,054 85	24,421 94	\$1,019 65
11,383 71	6,866 55	.....	.....	2,513 70	86,721 87	29,367 04	116,088 91	46,435 56	.....
8,374 46	21,089 37	.....	.....	1,175 35	49,252 10	27,459 80	76,711 90	30,684 76	803 95
5,865 94	2,506 00	4,621 36	.....	3,129 85	61,051 39	56,434 42	117,485 81	46,994 22	127 23
26,413 85	5,458 55	1,500 00	54,768 20	2,210 98	236,441 26	12,435 03	248,876 29	99,550 52	.....
7,939 47	5,681 49	.....	.....	1,347 11	27,776 32	22,754 31	50,530 63	20,212 25	14 60
							1,130 00	452 00	Hold back on bridge in 1918
7,384 46	60,702 80	.....	.....	2,941 67	73,083 79	36,343 32	109,427 11	43,770 84	346 68
	3,724 81	15,014 50	.....	2,339 07	64,124 51	4,210 77	68,335 28	27,334 11	282 20
5,162 39	774 65	.....	.....	1,361 34	34,839 58	12,646 80	47,486 38	18,994 55	.....
10,775 77	11,993 67	.....	.....	2,918 08	25,687 52	60,825 84	86,513 36	34,605 34	.....
20,949 95	18,163 85	2,809 46	.....	1,947 66	52,856 74	55,459 90	108,356 64	43,342 66	.....
16,028 04	3,019 35	.....	.....	2,386 47	37,480 89	40,522 09	78,002 98	31,201 19	587 00
28,209 97	4,722 38	3,585 91	.....	1,966 18	66,051 99	18,367 60	84,418 59	33,767 84	.....
22,353 35	13,207 37	.....	.....	2,314 87	61,156 40	22,886 28	84,042 68	33,617 07	.....
6,096 78	1,773 92	3,315 51	.....	2,220 71	69,386 67	34,978 68	104,365 35	41,746 14	.....
767 43	22,611 31	2,650 45	.....	1,680 45	35,788 47	12,447 39	48,235 86	19,294 34	.....
7,448 76	35,575 52	.....	.....	4,020 06	477,435 98	19,975 85	497,411 83	198,964 73	7,679 61
12,668 52	3,241 62	.....	.....	3,652 92	28,460 30	106,276 56	134,736 86	53,894 74	.....
14,455 89	31,618 82	17,214 61	.....	2,919 55	77,649 03	20,121 95	97,770 98	39,108 39	.....
	13,075 78	17,947 73	8,250 00	1,751 91	44,941 43	27,426 24	72,367 67	28,947 07	.....
9,366 00	8,439 48	5,016 79	.....	2,758 45	34,487 73	33,628 03	68,115 76	27,246 30	.....
							409 00	163 60	Rental of road roller in 1918
	10,600 64	5,933 71	.....	1,826 49	75,741 64	18,134 40	93,876 04	37,550 42	375 00
	2,084 64	.....	.....	1,678 50	24,136 02	20,174 63	44,310 65	17,724 26	.....
	563 61	.....	.....	1,293 00	84,191 55	16,081 45	100,273 00	40,109 20	.....
9,050 25	925 00	.....	.....	834 60	10,809 85	11,032 37	21,842 22	8,736 89	.....
							1,143 13	228 63	1918 M't'ce.
23,891 35	53,857 82	.....	.....	2,206 40	179,842 28	14,971 29	194,813 57	77,925 43	3,217 04
762 08	5,785 83	.....	.....	2,306 97	23,884 62	20,389 18	44,273 80	17,709 52	450 90
23,804 17	43,753 87	.....	.....	3,833 27	115,433 29	9,376 91	124,810 20	49,924 08	840 33
19,129 98	778 86	17,057 28	.....	2,308 35	46,838 21	51,317 36	98,155 60	39,262 24	8,802 68
4,862 07	1,281 47	.....	.....	3,705 14	97,175 78	53,852 53	151,028 31	60,411 32	.....
2,970 86	11,015 87	26,008 20	.....	1,921 25	42,715 92	26,008 68	68,724 60	27,489 84	8 80
5,454 29	1,867 69	.....	.....	2,058 71	23,393 01	17,563 09	40,956 10	16,382 44	811 47
			Stone Quarry						
	14,361 27	.....	2,212 40	2,137 88	44,961 85	68,217 73	113,179 58	45,271 83	.....
28,012 59	8,059 92	11,312 25	.....	2,675 28	60,337 65	47,142 17	107,479 82	42,991 92	.....
2,727 95	4,014 20	.....	.....	4,041 54	56,735 36	55,411 14	112,146 50	44,858 60	.....
16,221 46	4,958 43	.....	.....	4,158 31	216,763 83	32,176 95	248,940 78	99,576 31	2,870 45
385,001 73	477,932 58	136,077 32	67,530 60	90,893 81	2,861,418 66	1,160,971 84	4,022,073 63	1,609,800 49	28,237 59

APPENDIX

SUMMARY,

Statement of Work and Expenditure on

County	Work Done during Year						
	Miles Graded	Miles Stoned	Miles Gravelled	Tile Drain Rods	Bridges	Pipe and Tile Culverts	Other Culverts
Brant .....	.75	Conc. .25	.....	26.65	.....	26	.....
Bruce	2.	.....	5.	21.	5	56	9
Carleton .....	.....	Pen. Mac. .33	.....	.....	1	.....	.....
Dufferin	1.4	1.3	.....	.....	.....	10	1
Elgin .....	.25	.5	.62	150.	1	.....	12
Essex .....	.....	Conc. .37	.....	472.	.....	.....	.....
Frontenac .....	.75	1.75	.....	.....	2	19	1
Grey .....	.34	10.37	.....	.....	7	20	22
Haldimand	7.5	16.	.....	.....	1	47	.....
Halton	2.	.....	.....	.....	1	9	.....
Hastings .....	.....	.....	.....	.....	2	.....	.....
Huron .....	.....	.....	.....	.....	.....	.....	1
Kent .....	.45	Con. .36	.....	401.	2	.....	2
Lambton	1.4	.12	.95	1,114.	2	10	6
Lanark .....	.5	2.	.....	.....	3	12	.....
Leeds and Grenville .....	.....	.....	.....	.....	.....	.....	.....
Lennox and Addington .....	.....	.....	.....	.....	.....	.....	.....
Lincoln .....	.....	.....	.....	.....	.....	.....	.....
Middlesex .....	.....	.....	.....	.....	2	3	.....
Norfolk .....	.94	Bit Mac. 2.87	.....	.....	.....	3	.....
Northumberland and Durham .....	.....	.....	.....	.....	.....	.....	.....
Ontario .....	.....	.09	.....	14.	.....	6	3
Oxford .....	.....	.....	.....	.....	.....	.....	.....
Peel .....	.....	.....	.....	.....	1	8	.....
Perth .....	.....	.....	.....	984.	3	4	.....
Peterborough .....	.....	.....	.....	.....	.....	.....	.....
Prescott and Russell	7.69	Bit. Mac. 3.21	.....	.....	1	30	1
Prince Edward .....	.....	.87	.....	3.	.....	3	.....
Renfrew	4.89	.42	.....	.....	2	6	.....
Simcoe .....	.75	Conc. .75	12.5	.....	.....	10	1
Stormont, Dundas and Glengarry .....	.....	2.75	.....	121.	2	.....	1
Victoria .....	.87	Asp. Con. .75	.....	24.2	.....	8	3
Waterloo .....	.....	Con. 1.37	.....	.....	2	3	2
Welland	2.	.67	.....	.....	.....	2	3
Wellington .....	.....	.....	.12	.....	.....	.....	2
Wentworth .....	.....	.04—2.08	.....	.....	.....	1	3
York .....	.18	Bit. Mac. 1.32	.....	272.	.....	5	38
Totals	34.66	*51.41	19.19	3,602.85	40	301	111

* Including 39.83 miles stone, 3.10 miles concrete and cement, 7.73 miles Penetration Macadam, .75 miles Asphaltic concrete.

No. 2

1919

Provincial County Road Construction

Approved Expenditure During Year

Roads and Culverts	Bridges	Special Grants to Towns and Villages	Total Approved Expenditure on Construction	Total Approved Expenditure on Maintenance	Total Approved Expenditure	Government Grant	60% Dis. allowed
\$10,494 18	.....	.....	\$10,494 18	\$8,786 17	\$19,280 35	\$11,568 21	.....
38,266 63	\$10,644 94	.....	48,911 57	18,705 61	67,617 18	40,570 31	.....
.....	71,498 75	.....	71,498 75	6,135 62	77,634 37	46,580 62	.....
8,279 38	526 20	.....	8,805 58	2,758 85	11,564 43	6,938 66	.....
19,153 46	21,213 49	.....	40,346 95	22,661 80	63,008 75	37,805 25	.....
10,083 50	.....	.....	10,083 50	3,657 96	13,741 46	8,244 88	.....
7,041 34	1,769 65	.....	8,810 99	11,562 37	20,373 36	12,224 02	.....
99,452 17	10,966 77	.....	110,418 94	10,190 14	120,609 08	72,365 45	.....
139,930 77	2,693 42	\$24,712 00	167,336 19	7,647 06	174,983 25	104,989 95	.....
5,642 34	66,246 64	.....	71,888 98	3,987 91	75,876 89	45,526 13	.....
.....	4,095 50	.....	4,095 50	47,898 30	51,993 80	31,196 28	.....
1,226 10	.....	.....	1,226 10	21,816 35	23,042 45	13,825 47	.....
11,805 55	2,756 74	.....	14,562 29	5,435 47	19,997 76	11,998 66	.....
17,334 86	2,153 18	1,579 42	21,067 46	10,795 35	31,862 81	19,117 69	.....
20,589 90	8,617 39	.....	29,207 29	14,378 10	43,585 39	26,151 23	.....
.....
.....	.....	2,694 00	2,694 00	20,677 86	23,371 86	14,023 12	.....
.....
545 15	6,598 24	.....	6,943 39	24,346 22	31,289 61	18,773 77	.....
56,473 69	.....	.....	56,473 69	3,616 51	60,090 20	36,054 12	.....
.....	.....	.....	.....	38,316 68	38,316 68	22,990 01	.....
2,836 67	.....	1,446 26	4,282 93	13,894 48	18,177 41	10,906 45	.....
.....	.....	.....	.....	4,305 72	4,305 72	2,583 43	.....
747 35	858 51	.....	1,605 86	28,040 81	29,646 67	17,788 00	.....
2,125 78	1,618 00	.....	3,743 78	12,751 02	16,494 80	9,896 88	.....
.....
97,470 25	4,266 00	.....	101,736 25	12,419 49	114,155 74	68,493 44	.....
7,609 01	.....	.....	7,609 01	23,714 39	31,323 40	18,794 04	.....
23,246 19	16,792 94	.....	40,039 13	1,800 90	41,840 03	25,104 02	.....
33,685 43	.....	9,380 84	43,066 27	12,628 40	55,694 67	33,416 80	.....
.....
27,369 38	7,392 02	.....	34,761 40	58,773 35	93,534 75	56,120 85	.....
27,359 46	106 66	.....	27,466 12	14,829 77	42,295 89	25,377 53	.....
.....
37,209 27	1,578 85	.....	38,788 12	10,355 26	49,143 38	29,486 03	.....
6,506 40	.....	.....	6,506 40	21,962 47	28,468 87	17,081 32	.....
1,555 87	.....	9,910 38	11,466 25	47,508 03	58,974 28	35,384 57	.....
4,983 53	.....	.....	4,983 53	17,934 05	22,917 58	13,750 55	1,516 92
92,951 58	.....	.....	92,951 58	21,700 11	114,651 69	68,791 01	.....
.....
811,755 19	242,393 89	49,722 90	1,103,871 98	585,992 58	1,689,864 56	1,013,918 75	1,516 92

SUMMARY,

APPENDIX

Schedule of Expenditure on Maintenance

For the period beginning Jan. 1st, 1919,

County	Grading	Culverts	Resurfacing	Dragging	Oiling or Tarring
	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
Brant	292 57	69 80	10,370 24	3,040 52	867 46
Bruce	3,485 42	212 03	23,996 81	632 44	.....
Carleton	4,532 21	417 91	22,853 57	1,009 80	.....
Dufferin	3,087 98	825 74	22,974 86	138 59	.....
Elgin	3,320 24	1,241 22	43,199 15	7,162 26	.....
Essex .....	.....	91 05	1,856 97	10,322 94	.....
Frontenac .....	.....	.....	21,855 18	.....	899 13
Grey	3,993 54	2,247 22	28,000 00	283 40	.....
Haldimand	1,606 65	2 75	243 22	2,331 90	.....
Halton .....	.....	661 36	11,329 15	123 30	49 89
Hastings	4,191 04	500 68	54,911 09	.....	.....
Huron	4,542 62	1,101 26	46,758 79	481 35	.....
Kent	3,079 59	878 27	19,310 74	13,845 53	.....
Lambton	2,409 49	372 03	8,961 27	5,655 81	.....
Lanark .....	.....	28 50	21,276 76	34 15	.....
Leeds and Grenville	3,894 93	1,657 56	26,378 62	1,491 79	.....
Lennox and Addington	281 19	119 09	11,705 08	.....	.....
Lincoln	521 53	204 25	3,499 81	9,686 83	5,559 36
Middlesex	6,953 19	1,454 21	84,599 85	3,344 03	4,473 38
Norfolk	3,838 17	611 78	10,663 82	1,761 75	.....
Northumberland and Durham	900 00	172 00	25,471 68	882 56	.....
Ontario	7,114 58	624 56	23,243 66	1,550 41	3 11
Oxford	17,197 52	330 10	21 15	260 29	.....
Peel	153 65	.....	18,093 42	264 55	1,049 12
Perth	2,827 68	28 60	12,317 00	72 50	.....
Peterboro	292 80	826 51	9,470 74	.....	.....
Prescott and Russell	3,545 71	555 52	1,628 80	3,390 30	.....
Prince Edward	514 00	251 81	18,897 12	.....	.....
Renfrew	1,070 18	2,557 41	4,807 06	775 49	.....
Simcoe	2,141 93	277 70	46,341 86	1,036 44	.....
Stormont, Dundas and Glen- garry	11,156 70	1,842 20	34,729 89	2,556 80	1,150 16
Victoria	3,208 59	330 73	19,297 33	296 30	.....
Waterloo	420 00	155 43	12,115 43	1,055 40	.....
Welland	5,387 85	120 29	59,188 20	1,405 59	1,847 34
Wellington	5,898 96	1,281 52	33,504 10	836 82	2,377 19
Wentworth	6,261 53	.....	43,123 34	.....	5,585 21
York	5,105 39	.....	13,007 65	1,877 58	11,071 83
Totals	123,227 43	22,051 09	850,003 41	77,607 42	34,933 18

1919.

No. 3

and Repair of County Roads

ending Dec. 31st, 1919.

Snow Shovelling	Bridges	Ditching and Draining	Cutting Weeds and Brush	Wire Fence Bonus	Total Expenditure	Total Government Grant, 40 %
\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
.....	27 00	17 50	546 90	.....	15,231 99	6,092 80
99 72	796 90	.....	.....	58 75	29,282 07	11,712 83
.....	468 05	85 50	.....	.....	29,367 04	11,746 82
84 30	320 93	17 40	10 00	.....	27,459 80	10,983 92
12 00	809 49	.....	690 06	.....	56,434 42	22,573 77
.....	164 07	.....	.....	.....	12,435 03	4,974 01
.....	.....	.....	.....	.....	22,754 31	9,101 72
536 00	531 38	244 93	.....	506 85	36,343 32	14,537 33
.....	.....	.....	26 25	.....	4,210 77	1,684 31
.....	483 10	.....	.....	.....	12,646 80	5,058 72
64 20	1,158 83	.....	.....	.....	60,825 84	24,330 34
83 20	2,009 41	196 55	326 72	.....	55,499 90	22,199 96
.....	2,424 65	887 74	9 00	86 57	40,522 09	16,208 84
.....	194 55	Opertg. Ferry 480 85	293 60	.....	18,367 60	7,347 04
.....	74 50	.....	.....	1,472 37	22,886 28	9,154 51
82 50	962 33	510 95	.....	.....	34,978 68	13,991 47
84 98	204 55	.....	.....	52 50	12,447 39	4,978 96
2 00	187 22	.....	314 85	.....	19,975 85	7,990 34
54 69	1,578 31	2,911 65	907 25	.....	106,276 56	42,510 62
881 91	2,242 02	25 25	97 25	.....	20,121 95	8,048 78
.....	.....	.....	.....	.....	27,426 24	10,970 50
105 02	238 38	.....	432 71	315 60	33,628 03	13,451 21
.....	325 34	.....	.....	.....	18,134 40	7,253 76
86 20	527 69	.....	.....	.....	20,174 63	8,069 85
7 50	828 17	.....	.....	.....	16,081 45	6,432 58
.....	54 82	.....	387 50	.....	11,032 37	4,412 95
2,721 95	3,129 01	.....	.....	.....	14,971 29	5,988 52
265 60	460 65	.....	.....	.....	20,389 18	8,213 03
32 00	134 77	.....	.....	.....	9,376 91	3,750 76
.....	1,324 03	.....	.....	195 40	51,317 36	20,526 94
133 00	734 72	.....	1,165 08	383 98	53,852 53	21,541 01
43 85	83 73	Survey 37 75	92 70	2,617 70	26,008 68	10,403 47
.....	3,627 43	Storm Fence 189 40	.....	.....	17,563 09	7,025 24
12 80	81 91	.....	173 75	.....	68,217 73	27,287 09
157 95	2,464 44	.....	.....	621 19	47,142 17	18,856 87
.....	.....	Guard Rail 441 06	.....	.....	55,411 14	22,164 46
381 28	733 22	.....	.....	.....	32,176 95	12,870 78
5,932 65	29,385 60	6,046 53	5,473 62	6,310 91	1,160,971 84	464,446 11

Prescott and Rus- sell	5,677 39	120 50	3,285 00	2,134 28	.....	498 20	704 12	.....	.....	.....	.....	12,419 49	7,451 69
Prince Edward ..	1,862 55	334 90	21,490 14	.....	.....	26 80	.....	.....	.....	.....	.....	23,714 39	14,228 63
Renfrew	260 09	32 55	1,075 56	410 20	.....	22 50	.....	.....	.....	.....	.....	1,800 90	1,080 54
Simcoe	346 00	379 20	11,601 20	198 00	.....	.....	104 00	.....	.....	.....	.....	12,628 40	7,577 04
Stormont, Dundas and Glengarry ..	4,254 78	254 26	49,087 17	101 45	3,442 97	524 36	871 11	.....	100 25	37 00	58,773 35	35,264 01	
Victoria	1,006 45	315 08	12,348 43	163 10	.....	18 78	10 15	141 15	144 93	681 70	14,829 77	8,897 86	
Waterloo .....	.....	.....	8,700 57	380 69	1,274 00	.....	.....	.....	.....	.....	10,355 26	6,213 16	
Welland	1,197 90	87 10	18,715 50	335 10	1,559 77	.....	.....	.....	67 10	.....	21,962 47	13,177 48	
Wellington	15,254 62	1,197 83	24,335 83	401 55	3,539 48	59 15	2,423 09	.....	.....	296 48	47,508 03	28,504 82	
Wentworth	750 00	.....	15,977 25	.....	1,206 80	.....	.....	.....	.....	.....	17,934 05	10,760 43	
York	3,305 02	1 00	8,007 16	417 06	8,743 51	243 90	982 46	.....	.....	.....	21,700 11	13,020 07	
Totals	75,850 12	7,507 45	442,230 62	20,828 01	23,828 59	2,162 07	8,288 50	1,782 25	1,454 59	2,060 38	585,992 58	351,595 56	

APPENDIX No. 5

REPORTS OF COUNTY ROAD INSPECTION

TORONTO, January 6th, 1920.

W. A. McLEAN, Esq.,

Deputy Minister of Highways, Ontario.

SIR:

I have the honour to submit a summary report on the improvement of the County Roads during the year 1919, in the Counties of Carleton, Elgin, Frontenac, Grey, Lincoln, Peel, Peterborough, Welland and Wellington, according to the provisions of the Highway Improvement Act.

During the year several special visits were made at the request of the County Councils and the Road Superintendents, when matters of special importance were being considered. The assistance and advice of the Department in such cases is much appreciated by the members of the Councils.

Owing to the scarcity of labour, comparatively little permanent work, other than the construction of necessary bridges and culverts, was undertaken by the above named counties. An attempt was made to keep the roads in a passable condition, pending the return of more favourable conditions for permanent work.

Respectfully submitted,

ROBT. C. MUIR,

Engineer of County Roads.

Carleton

The outstanding feature of construction was the building of the Wilson Bridge, consisting of one 160-foot span and two 64-foot spans with a 20-foot clear roadway, at a cost of \$71,498. This bridge is on the Provincial County Road and known as the Ottawa-Pembroke Road. Other work on the Provincial County Roads was chiefly resurfacing, in short stretches, with gravel.

The construction work on the County Roads consisted in building gravel or macadam roads in stretches varying from 0.30 to 1.30 miles in length, 9 feet wide and 9 inches deep, approximately 16 miles of road were built, together with 12 miles of grading. A bad feature of road construction in this County is that the grade is too narrow and too high. A grade of 24 feet wide, with a fall of 14 inches from the crown of the road to the shoulder, is to be recommended. In addition, three bridges, 16-foot to 30-foot span, were built, together with six concrete box culverts and twenty-five pipe culverts. One gasoline tractor was purchased during the year at a cost of \$2,286.

It is the intention of the County Council at the January session to abandon the township system of carrying out the work, and adopt a County Road System, and it is hoped that better results will be obtained.

Elgin

The outstanding piece of work carried out during the past year was the building of a 40-foot reinforced concrete arch bridge and grade reduction at Springer Hill. Approximately \$28,000 was expended on this work. Other work on Provincial County Roads consisted of surfacing with gravel or crushed stone, and the laying of corrugated iron pipe culverts.

The chief work carried on in this County is the reshaping of old gravel roads, and applying gravel in thin layers. A system of road maintenance has been adopted, and excellent results have been obtained. The gravel roads are kept in first class shape by the constant use of the road drag. By this systematic dragging, the reconstruction of these roads is in many cases deferred, enabling the County to devote attention to more urgent problems. This system of maintenance is commended, and many other counties, where gravel is used for surfacing, would be well advised to adopt a similar method. The system of book-keeping and method of passing and paying accounts is also to be commended.

Frontenac

The construction work on the Provincial County Roads consisted chiefly in laying a large number of concrete tile culverts, and surfacing with crushed stone. Approximately two miles of macadam road were completed and two reinforced concrete bridges

of 14-foot span and 22-foot clear roadway were built. An excellent finish has been obtained on all concrete work carried out by day labour. Many miles of stone roads were resurfaced with crushed stone.

Extensive grade reduction through rock, in the township of Loughborough, was carried out, the material being used for widening, and crushed for surfacing. Numerous concrete tile culverts were laid on several of the County Roads, together with two 5-foot span reinforced concrete arch culverts. A 40-foot span reinforced concrete arch bridge, 22-foot clear roadway, was built near Westbrook, together with the erection of a guard rail, widening and raising of old grade. A decided improvement has been carried out at this point.

The lack of outfits to carry on the work is a hindrance to extensive road building in this County. With more machinery at the disposal of the superintendent, more satisfactory results could be obtained.

Grey

With the exception of building three concrete box culverts, and completing the steel superstructure on a bridge, the construction work was confined to Provincial County Roads. The County Roads are kept in passable condition, the sod shoulders in many places being cut down, the ditches cleaned and the road resurfaced with gravel.

The construction work on the Provincial County Roads consisted chiefly in building seven reinforced concrete bridges, varying from 12-foot to 50-foot span, and building approximately 7.50 miles of water-bound macadam road, 18 feet wide and 10 inches deep. An exceptionally bad feature in building macadam roads in this County is the use of too small a stone for surfacing, the practice being to obtain a crown by using stone passing a 1½-inch ring. Road of this construction will soon deteriorate. On a part of the Toronto-Sydenham Road, three miles north of Markdale, the work of raising and widening the road through a swamp which was commenced in the fall of 1918 was again in progress. This is an exceptionally bad spot, as it is difficult to obtain a stable roadbed. The work is being carried out by contract at a cost of 90 cents per cubic yard.

In order to construct water-bound roads, three complete outfits were purchased during the year, each outfit consisting of—12-ton steam roller; stone crusher, with screen and bin; grader; water tank; tractor, 20-40; gasoline engine and pump; pick plow; slush scrapers; four dump wagons; steel drags; 1-ton motor truck; together with the necessary steam drills and boiler for use in the quarry. These outfits have been in constant use during the greater part of the year. Approximately \$57,000 was expended on new machinery.

Lincoln

As in 1917 and 1918, extensive grading was carried out, approximately 19.5 miles of road being graded to a width of 24 to 28 feet. This County has paid special attention to this class of work, with the result that many miles of poorly drained roads have been put into excellent shape. These roads are kept in good shape by the constant use of the log drag. Gasoline tractors are used on this work. The grades are reduced, and the roads widened and strengthened.

A minimum width of 16 feet of metalled surface on all classes of roads was adopted by the Council before work for the year was commenced. During the year approximately 29 miles of roads were surfaced, consisting of 16 miles of bituminous penetration, 1.5 miles of cement concrete, 7 miles of water-bound macadam, and 4.5 miles of gravel. Approximately 2,600 cubic yards of stone were obtained from the two quarries owned and operated by the County, the remainder being imported from several commercial quarries. The County purchased another quarry in the vicinity of Jordan at a cost of \$800.

The cost of constructing the bituminous penetration roadway, consisting of a base of six inches of crushed stone, and a 3-inch penetration top, varied from \$1.52 to \$1.68 per square yard. The cost of the cement concrete pavement, seven inches deep, was \$2.60 per square yard.

Three bridges, consisting of spans varying from 18 to 70 feet, were built during the year, together with three concrete box culverts. Approximately one mile of tile underdrains were laid, together with 365 corrugated iron pipe culverts.

The chief units of machinery purchased during the year consisted of the following: Two 15-ton steam rollers at a cost of \$4,060 each; stone crusher, complete, \$3,060; two traction engines, \$3,300 each; derrick and hoist, \$3,422; asphalt heating pans, \$2,700; three vertical boilers (10 h.p.) for heating bituminous material, \$467 each. This County owns a most extensive plant, all the work being done by day labour.

Peel

Construction work in this county consisted chiefly in grading, grade reduction, laying pipe culverts and surfacing with gravel or crushed stone. Corrugated iron pipes were used throughout as culverts, the majority of these being used at farm entrances. Approximately $4\frac{1}{2}$ miles of grading and 3 miles of surfacing with gravel or crushed stone were completed.

The construction work on the Provincial County Roads consisted in laying pipe culverts where required, erecting a guard rail and building a 14-foot span reinforced concrete bridge.

The majority of the stone or gravel roads in the Township of Toronto had a light surface treatment of asphaltic oil, many of the roads being scarified and reshaped with the addition of new stone.

During 1919 the County Road System was extended from 140 to 178 miles, being approximately 21 per cent. of the total road mileage in the county.

Construction work in this county has been greatly retarded by not having a permanent gang; the work at present being carried out on a township system, with the result that the work is done in short stretches, and is very unsatisfactory.

Peterborough

The County Road System in the County of Peterborough came into effect with the passing of the necessary by-law on the 30th day of June, 1919, when the townships of North Monaghan, Otonabee and Asphodel assumed a county road mileage of 108 miles. At a later session of the County Council, held on July 25th, 1919, the township of Belmont came into the system, bringing the County Road mileage up to 137 miles.

Owing to the late date of commencement of operations under the Act, it was not expected that much more than organization work would be accomplished this year. A start, however, was made on replacing several old wooden bridges with reinforced concrete structures, and resurfacing many of the neglected gravel roads.

The County Road Superintendent is Mr. Duncan McFarlane, Keene, Ont.

Welland

The construction work on County Roads in this county during the year 1919 consisted chiefly in grading, laying a large number of pipe culverts, and building twenty-one concrete box culverts, varying from 3-foot to 8-foot span. Approximately 15.50 miles of road was graded to a width of twenty-six feet. Two miles of water-bound macadam road, ten feet wide and nine inches deep, were constructed by contract, at a cost of \$4,860 per mile. A stone quarry was purchased in the Township of Pelham.

The four outfits belonging to the county were used on maintenance work, consisting of resurfacing with crushed stone, with satisfactory results. Many of the roads were given a bituminous surface treatment.

The work on the Provincial County Roads consisted of three miles of grading, three concrete box culverts, and about one mile of water-bound macadam road, sixteen feet wide, and nine inches deep. Work of the nature of widening of the macadam surface from ten to sixteen feet was carried out in several places.

The chief units of machinery purchased during the year were: One 10-ton steam roller at a cost of \$4,850, and one 1-ton motor truck at a cost of \$2,875.

Wellington

As in previous years, the chief work carried out in this county was the building of bridges. Thirteen bridges were built, varying in spans from twelve to thirty-eight feet; the majority of these are of the overhead reinforced concrete arch truss type. Approximately \$28,000 were expended on bridge construction during the year. No road surfacing of any extent was carried out during the year.

The other features of construction were the building of a concrete abutment, concrete breakwater 120 feet long, and a retaining wall 100 feet long, in the village of Drayton; the raising of the steel trusses and laying a treated wood block floor on the Elora bridge; also the building of a concrete retaining wall at Mount Forest bridge. Several short stretches of macadam road were treated with a surface treatment of tar and sand. Approximately \$95,000 were expended in maintaining the roads, which consisted chiefly in resurfacing with gravel. One 12-ton steam roller was purchased in 1919, and is used exclusively on roads under the jurisdiction of the Guelph Suburban Roads Commission.

As in the case of many of the other counties the work is carried out under a township system, and which is the main reason why no permanent road surfacing to any extent has been accomplished. This county might be well advised to follow the procedure adopted in several other counties, by abandoning the present system and carrying on the work on a purely County Road basis.

TORONTO, April 7th, 1920.

W. A. McLEAN, ESQ.,
Deputy Minister of Highways, Ontario.

SIR:

Herewith I beg to submit a report on the improvement of the County Road Systems in the Counties of Bruce, Huron, Middlesex, Wentworth, Halton, York, Ontario, Victoria, Prescott and Russell, and Lanark for the year 1919, in accordance with the provisions of the Highway Improvement Act.

Respectfully submitted,

J. A. P. MARSHALL,
Assistant Engineer.

Bruce County

The most important work undertaken by Bruce County during 1919 was the construction of seven miles on Provincial County Road No. 51 between Kincardine and Tiverton. This is on what is known as the Saugeen Road. The old roadway was from twelve to sixteen feet wide, of travelled surface and many hills of excessive grade. The work was let by contract on a cost plus basis. This consisted of grading and ditching the entire length, and gravelling five miles to a width of sixteen feet and from nine inches to twelve inches in depth. There were fifty pipe and tile culverts placed, and one reinforced concrete box culvert built. Three bridges—Munro's, McLennan's and Montgomery's Bridge, consisting of 12-foot and 17-foot and 12-foot spans, were constructed at a cost of \$7,000 approximately. Considerable hill cutting was also undertaken. The contract calls for the work to be completed by the middle of July, 1920, and as yet $2\frac{1}{2}$ miles are to receive additional gravelling. The total cost of the work so far completed is approximately \$42,500.

On Provincial County Road No. 52, Fischer's Bridge in Lot 15, Con. "C" and "D," of Carrick Township, one 10-foot span reinforced concrete slab bridge was constructed. On Provincial County Road No. 6, the Arranvale bridge, at the deviation of the 30th side road, Con. VI. of Arran Township, was constructed. This structure consists of two 12-foot reinforced concrete slab spans.

On County Roads the only construction work undertaken was the construction of thirteen pipe and tile culverts, twelve concrete culverts of spans varying from four to eight feet, and three bridges. These bridges were the Enniskillen bridge, in Lot 60, Greenock Township; in Con. III., Kinloss Township; and Con. VIII., Sideroad 20, Huron Township. These spans were eighteen feet, ten feet, and sixteen feet.

Work was also undertaken under the special grants in Hepworth, Mildmay, Port Elgin, Tiverton, Tara, Paisley and Teeswater.

During the year approximately \$16,000 was expended on new machinery, which consisted of four gasoline tractors, 17.34 h.p., two 12-20 h.p., and one 15-27 h.p., five graders, stone crusher, elevator, bin and screens, a number of wheel scrapers and steel road drags.

Maintenance work on County Roads for 1919 amounted to \$29,282.07, over 223 miles, on an approximate expenditure of \$131.30 per mile.

Huron County

During 1919 Huron County spent most of their expenditure on maintenance work.

The Provincial County Road construction consisted of a reinforced concrete arch culvert opposite Lot 42, con. XIII., East Wawanosh Township. The maintenance for these seventy-four miles amounted to \$21,816.35, or an expenditure of \$295 per mile for 1919.

On County Road work, four miles of crushed gravel surfacing was undertaken, along with six small pipe and tile culverts, and five concrete culverts. Five bridges were constructed, ranging in spans from ten feet to eighty feet. A commendable feature of the work as undertaken is the neat design and construction of the concrete bridges and culverts. The maintenance work for these 344 miles amounted to \$55,500, or approximately \$161.30 per mile during 1919.

During 1919 approximately \$17,000 was expended on new machinery. This consisted of three gasoline tractors of 10-20 h.p., nine graders and two wheel scrapers. One crusher complete with screen bin and elevator was also purchased. The gasoline tractors did splendid work in light grading.

During the year a number of additional miles have been added to the County System. These consist of important connecting links to adjoining counties and also extensions in the villages lying opposite to agricultural lands, and otherwise balancing out the System as a whole.

In December, owing to ill-health, Mr. Donald Patterson, who has been County Engineer of Huron County and County Road Superintendent since Huron County adopted the County Road System, was forced to relinquish his duties. His position has been taken by his son, Mr. T. R. Patterson.

The total road mileage to the end of 1919, under the jurisdiction of the County of Huron, is 418 miles, of which 74 miles are designated as Provincial County Roads.

Middlesex County

A commendable feature of the County Roads System in 1919 was the doing away with the township idea in regard to the management of the County Road System. The County Council at the June meeting was unanimous on this move to put the County Road System on a purely county basis.

On the Provincial County Roads, which take in the Longwoods Road, Sarnia Gravel, Proof Line, and Wyton-St. Mary's Road, a number of small culverts were constructed. On the Longwoods Road, just west of Delaware, the Seabrook bridge was constructed. This structure consists of a 12-foot span of reinforced concrete slab design. The cost was \$1,840. The Birr bridge, in Con. XII., of London Township, on the Proof Line Road, consisting of a 50-foot span of reinforced concrete and steel, was constructed at a cost of \$4,758.24. This completes the permanent structures on the Proof Line Road.

On the Provincial County Roads, consisting of eighty-nine miles, \$24,346.22 was spent in maintenance, and an expenditure of \$273.56 per mile during 1919. This work consisted of grading, resurfacing, dragging, oiling, snow roads, cutting weeds, opening drains and repairing culverts and bridges.

On the County Roads 2,987 rods of tile draining were laid. Thirteen small pipe or tile culverts and two concrete culverts were constructed. In Con. XVI. of London Township, on County Road No. 16, a steel and concrete bridge of 24-foot span was constructed at a cost of \$1,467.10. On County Road No. 17c, in Lot 30, Con. XVIII-XIX, of East Williams, a 50-foot span was built. Owing to the lateness of the season the concrete floor was not built. Over the Sydenham River, in the Town of Strathroy, a 75-foot span steel-concrete bridge, with a 6-foot sidewalk, was built. As in the case of the bridge in East Williams, the concrete floor was not laid owing to the cold weather setting in. The total bridge expenditure on these three bridges amounted to \$12,668.52.

On the County Roads there was an expenditure of \$90,201.16, on maintenance on a mileage of 284 miles, and an expenditure per mile of \$353.17, during the 1919 season.

On the London Suburban Roads, which comprise a mileage of forty-four miles, an expenditure of \$16,075.40 was made on maintenance, or an average expenditure of \$365.33 per mile during 1919. On some of these roads adjacent to the city of London conditions have changed considerably, due to traffic developments during the last few years. It seems almost imperative that a more lasting surface should be laid on these roads in the close proximity of London.

Some oiling was done on the Pipe Line Gravel Road between Springbank and London. Arrangements are being made whereby additional roads will be oiled during 1920.

During 1919 approximately eighty additional miles was added to the County Road System. These additions were put on to round out the System and connect up numerous disjointed portions. The System at the end of 1919 comprises 506 miles, of which eighty-nine miles are designated as Provincial County Roads.

Prescott and Russell

During the year the United Counties of Prescott and Russell undertook an extensive programme of road construction. The programme of construction as carried out by these counties consisted of considerable work on the Provincial County Road from Orleans to Point Fortune.

The contract for the construction of five miles of this Provincial County Road of bituminous macadam (asphalt binder), beginning at the Carleton boundary, at the village of Orleans, was awarded early in 1919 at the price of \$3.35 per cubic yard for the crushed stone, and 36c. per square yard for the asphalt binder. About half a mile of this road is completed, and two and one-half miles with the bottom course laid down. Considerable work was done in order to prepare the sub-grade into shape, such as grading, rock cutting and draining before placing the stone. This latter work was done by day labour.

In the vicinity of Rockland a contract was awarded for the construction of seven miles of road, beginning at the western limits of the village, and running westward in order to connect with the above portion of road. The price was \$3.30 per cubic yard for the crushed stone and 44c. per square yard for the Tarvia binder. About half a mile of this road is completed and another half mile with the bottom course laid down.

At L'Original two miles of bituminous macadam was constructed. The surface was laid 16 feet in width on a 28-foot grade. The cost of this work was approximately \$35,000. The contract price was \$3.35 per cubic yard for the crushed stone and 43c. per square yard for the tarvia binder.

Preliminary grading, grubbing, and clearing right-of-way has been done for a distance of three miles east of the village of Plantagenet.

Opposite Lot 14, Con. I., in East Hawkesbury, near Chute à Blondeau, a concrete beam bridge of 22-feet span was built at a cost of \$4,266.

On the maintenance of this Provincial County Road from Orleans to Point Fortune, a distance of sixty miles, the sum of \$12,419.49 was spent, or approximately \$207 per mile for the year 1919.

On County Road No. 15, in the Township of East Hawkesbury, westerly from the Quebec boundary, 1½ miles of waterbound macadam was constructed, at a cost of \$9,547.23. Day labour was employed on this particular work and field stone used.

On County Road No. 15, in the Township of West Hawkesbury, 1.12 miles of bituminous macadam, using asphalt as a binder, was constructed just south of Vank-leek Hill. This was done at a price of \$3.35 per cubic yard for the crushed stone and 42c. per square yard for the asphalt penetration. The cost of this work is approximately \$14,000.00 to date.

On County Road No. 7, in the Township of South Plantagenet, three miles of waterbound macadam was constructed northerly from the village of St. Isidore. This work was undertaken by day labour at a cost of approximately \$27,500, using quarried stone. Considerable drainage work was undertaken in the village of St. Isidore.

In the Township of North Plantagenet, from Plantagenet village southerly to the Canadian Pacific Railway, a distance of 1½ miles was improved by building a waterbound macadam roadway. This was built by day labour at a cost of \$9,934.19, and using quarried stone.

In Russell Township, easterly from the Carleton boundary into the village of Russell, on County Road, metalling was done and three miles of waterbound macadam completed. This was built at a cost of approximately \$18,000 by day labour, and using field stone. In comparison with the other work as undertaken by the counties during the season, this work at Russell was the cheapest, as far as the building of waterbound macadam construction is concerned.

On County Road No. 8, in Clarence Township, 0.75 miles of waterbound macadam were built at a cost of approximately \$2,900, near the village of Clarence.

Four bridges were built during 1919 on the County Roads in Prescott and Russell and some of the approaches and finishing up completed on the 1918 work. These are all of reinforced concrete and steel design, and are of neat appearance and design.

During the year approximately five miles were added to the County Road System; these consisted of small stretches at Clarence, Russell, Casselman, Rockland and at Bourget.

The total mileage of the County Road System in Prescott and Russell at the end of 1919 consists of 228 miles, of which 60 miles are designated as Provincial County Roads.

Ontario County

During 1919 Ontario undertook a systematic maintenance of the roads under the County Road System. Construction work consisted chiefly of bridge and culvert construction. Early in the year, the Centre Road, running northerly from Whitby to Atherly, was approved as a Provincial County Road. Later in the year the road from Manchester through Port Perry, Sonya and Seagrave, to connect with Victoria County's Provincial County Road on to Lindsay, was also approved as a Provincial County Road.

On these Provincial County Highways a number of culverts were built, and approximately \$14,000 was spent on maintenance work, which consisted of grading, light gravelling, ditching and general upkeep of the road surface.

On the County Roads, four bridges, all of 16-foot span, and consisting of reinforced concrete slab, were constructed, viz.: The Columbus bridge, and the Hayes bridge in East Whitby Township, and Lehman's bridge and the Brock Road bridge in Pickering township. These four bridges have a good appearance and cost approximately \$9,400.

On County Road No. 7, in the Township of Uxbridge, the old road crossed the Grand Trunk Railway twice within a few rods. A new right-of-way was purchased to the east of the railway, and the right-of-way graded and gravelled for a distance of fifty-five rods. This is a great improvement over the old conditions, as it does away entirely with having to cross the railroad tracks.

On County Road No. 14, Scugog Township, a concrete culvert was built, replacing an old wooden structure, which was unsafe for traffic. The height of fill at this point was 13 ft. 6 in., which made it necessary to build a long culvert 45 ft. long and 6 ft. square, of reinforced concrete. The approaches were widened considerably and a big improvement has been made. The cost of this work was approximately \$1,800.

The maintenance work on the County Roads for 1919 totalled \$33,628.03, which was expended on 173 miles, or approximately \$136.60 per mile.

During the year the following machinery was purchased: Two (12 ton) steam rollers, one heavy grader, and two wheel scrapers. Considerable work was done in light grading with a kerosene tractor of 15-30 h.p., purchased in 1918.

The advisory committee consists of three members of the County Council. A change was made in the County Road Superintendents this year.

A number of additions were made to the County Road System in Ontario County during the year 1919, approximately ten miles in all. This now makes a total road mileage under jurisdiction of the County Council of 243, of which 70 miles are designated as Provincial County Roads.

The County Road Superintendent is Mr. D. J. Kean, of Whitby.

Wentworth County

During 1919 approximately ninety miles was added to the County Road System of Wentworth County. Early in the year County Road No. 10, known as the Caledonia Road, and also County Road No. 1, known as the Dundas and Waterloo Road, were both designated as Provincial County Highways. During the fall the Burlington and Stoney Creek Road was also designated as a Provincial County Road. These, along with the Town Line Road, which was designated as a Provincial County Road in 1918, make a total of thirty-seven miles of Provincial County Highways.

On Provincial County Road No. 56, known as the Dundas and Waterloo Road at what is known as Christie's Corner, two reinforced box culverts of 112 feet in length and 78 feet, were built across the intersection. On the intersection considerable grading and metalling was done. This is a great improvement over the old conditions. At Dwyer's, in Lot 36, Beverly Township, a reinforced concrete culvert was built. Maintenance on these Provincial County Roads amounted to approximately \$18,000, or an expenditure on these thirty-seven miles of \$484.70 per mile during 1919.

About ten miles of preliminary grading has been done, all on the additional mileage added to the County Road System during the year. Two miles of metalling were also completed. Twenty small pipe and tile culverts and four concrete culverts were built. On County Road No. 20, opposite Lot 29, Con. III-IV, Beverly Township, a reinforced concrete slab bridge of 16-foot span with 24 feet of a clear roadway, was constructed. Wentworth County has a concrete crew under an experienced foreman, who do all the concrete work on these structures. This crew is supplied with a portable cook-house, tents, etc.

On the suburban area, work was carried out at Hog's Back, in Con. I, West Flamboro. This work consisted of the filling of approximately 4,800 cubic yards, and the widening out of what was previously a narrow, dangerous turn in the road just south of the Grand Trunk Railway. A 4-foot concrete culvert, 75 feet in length, was also constructed. On Barton Street about half a mile of macadam road was built here and three concrete culverts. Good results have been obtained by oiling these suburban roads.

Wentworth County Road mileage at the end of 1919 is 245 miles, of which 37 miles have been designated as Provincial County Roads.

Victoria County

During the season of 1919 Victoria County spent \$27,359.46 on the construction of Provincial County Roads. An asphaltic concrete roadway, sixteen feet in width, extending along the road allowance between Cons. VI-VII in the Township of Ops, from the south corporation limit of the Town of Lindsay, being the line between Lots 18 and 19, to a point opposite the south limit of the Riverside Cemetery, was laid a distance of 3,887 lin. feet. On Provincial County Road No. 40, in the Township of Ops, 280 rods of grading was undertaken. A number of culverts, pipe, tile, and concrete, completed the construction work done on these Provincial County Roads.

On the maintenance and repair of Provincial County Roads the sum of \$14,829.77 was spent, or an expenditure of \$218.08 per mile over the sixty-eight miles comprising these Provincial County Roads.

On County Roads a number of small culverts were constructed. On County Road No. 9, what is known as Spring Creek Bridge, in Lot 15, Con. XIII, Mariposa Township, was constructed. This bridge was built of reinforced concrete slab of 12-foot span, and 18 feet clear roadway. On County Road No. 8, what is known as Glenny's Bridge, in Lot 17, Con. V., of Mariposa Township, was constructed. This bridge consists of a reinforced concrete arch with suspended floor, and is of a 40-foot span.

Considerable work was done in the urban municipalities of Lindsay, Bobcaygeon, Fenelon Falls, Omemee, and Woodville.

In the Town of Lindsay, Queen Street from St. David Street to the boundary, St. David Street from King Street to Queen Street, and Lindsay Street from Mary Street, to the boundary, were paved with asphaltic concrete.

1. Queen Street—St. David Street to boundary—4,103.3 square yards	\$14,070 36
2. St. David Street—King Street to Queen Street	946 60
3. Lindsay Street—Mary Street to boundary	4,994 75
	<hr/> \$20,011 71

In Bobcaygeon, Joseph, Bolton and King Streets were improved. This work consisted of macadam, tile draining, and one culvert.

In Fenelon Falls, Colborne Street was improved. A new concrete culvert was constructed and considerable grading and gravelling.

In Omemee—one mile of macadam, eleven feet in width, eight inches in depth, was built on King Street.

In Woodville, on King Street and Eldon Street about 100 rods of macadam roadway was built.

Approximately \$26,008.68 was spent on the maintenance and repair of 160 miles of County Roads, or an average expenditure per mile of \$162.55, during 1919.

During 1919 the sum of \$10,302.61 was spent on the purchasing of new machinery, including a steam roller, crusher complete, steel tank, a number of drags and scrapers, dump wagons, two portable cabins, and other small tools and supplies.

Additional mileage was added to the County Road System during 1919. The total mileage under jurisdiction of the County Council at the end of 1919 is 228 miles, of which 68 miles have been designated as Provincial County Roads.

Lanark

During 1919 seventy-one miles of Provincial County Roads were designated and approved of. These are the Calabogie, Perth and Smith's Falls Road, the Perth-Carleton Place-Ashton Road, and the Perth-Rideau Ferry Road.

A suburban area has been established about Smith's Falls, and opposite Lot 1, Con. II, Elmsley, on the Smith's Falls-Perth Road two miles of macadam roadway has been built during 1919. The Black Creek Bridge opposite Lot 4, Con. III, in North Elmsley Township, consisting of two spans of 30 feet each, of concrete steel, was built at a cost of \$4,623.00. The Swale Bridge in Lot 1, Con. II, North Elmsley Township, was constructed of concrete and steel, consisting of a 24-foot span and costing \$1,975.00.

On Provincial County Road No. 83, in Lot 1, Con. III, Drummond, a concrete and steel bridge was erected of 24-ft. span at a cost of approximately \$2,000.00.

An expenditure totalling \$14,378.10 was spent on the seventy-one miles of Provincial County Roads on maintenance and repair work during the year, or an average expenditure of \$202.20 per mile.

Approximately 6½ miles of macadam and 1½ miles of gravel road were built on the country roads.

The Ferguson Falls Bridge over the Mississippi River in Lot 18, Con. XII of Drummond Township was constructed during the year. This bridge consists of five spans each of 42 feet 6 inches in length. The structure was constructed of concrete and steel, and the cost was \$20,751.65.

Lanark County do all their own concrete work by day labour for bridge abutments and culverts.

A commendable feature of the Lanark Organization is the system of road camps. At present there are three of these complete camps with tents, stable tents, cook house and kitchen. These are moved from place to place as the work progresses, and save an immense amount of time, as well as making for the comfort of the men employed.

Halton County

On account of the scarcity of labour, Halton County was unable to get as much work completed for 1919 as was contemplated. Considerable grading and hill cutting has been done, so that approximately twelve miles are now ready for metalling.

The most important work undertaken during 1919 was the completion of the Tansley Bridge. The Tansley Ravine is about 650 feet wide and 126 feet deep, and was formerly crossed by a 90-foot steel bridge about 25 feet above the stream, the approaches making a detour down the sides of the hills. These approaches were dangerous and practically impassable in bad weather, being on a curve, with grade as high as 16½ per cent. This steel structure, built in 1885, was badly rusted and was found to be too light for the traffic at the time Dundas Street became a Provincial County

Road. The County Council of Halton decided to build a new high level structure from the Centre Line of Dundas Street on the east to a point about 45 feet south of Dundas Street on the west side in order to shorten the structure by avoiding the cut made by the present road. Investigations and plans were then made by Mr. A. W. Connor, C.E., of Bowman & Connor, Consulting Engineers, Toronto. In August, 1917, the contract was awarded to Norman McLeod, Ltd., Toronto, who submitted a proposal to use old I.C.R. deck latticed girders, that had recently been replaced by heavier structure.

The superstructure consists of five-deck latticed girders of 108 ft. span, 13 feet 6 inches centre to centre with concrete floor beams and a concrete floor slab, 20 ft. wide from curb to curb. The curbs are 12 inches high by 10½ inches wide, and the concrete panel railing is 4 feet high.

The substructure consists of concrete abutments, with reinforced slab and counterfort wing walls and four concrete piers. The floor of the bridge is about 98 feet above low water level, and about 20 feet below the level of Dundas Street on the west side. The cut for the west approach will have a maximum depth of about 6 feet, and the approach will have a grade of 5 per cent. This approach reaches Dundas Street by a reverse curve of 253 foot radius.

The old cut on the east side was utilized and filled to the new grade of 5 per cent. The maximum depth of fill was 35 feet. Some of the grading and macadamizing of the approaches will not be completed until spring, but the bridge is now open for traffic.

The total length of the structure is 542.5 feet, or with approaches 1,450 feet. It was designed for Class C loading of the Ontario Department of Highways (20-ton concentrated load).

The launching of the girders without falsework was probably the most interesting feature of the work. A pilot (or pair of triangular trusses 60 ft. long with cross bracing) was used to carry each girder across its span.

The bridging of this Twelve Mile Creek and the proposed bridging of the Sixteen Mile Creek will enable this road to be so improved as to provide a main route between Toronto and Hamilton (via Cooksville and the Eaton Highway) relieving the traffic on the present Toronto-Hamilton Highway.

The work on the Tansley Bridge was done on a cost plus basis, and the total expenditure was about \$110,000.00.

Approximately \$4,000.00 was spent on maintenance on the thirty-eight miles of Provincial County Roads, or an approximate expenditure of \$105.00 per mile.

York County

During the year the following main county roads were assumed and designated as Provincial County Roads:

(1) Yonge Street, northerly from the City of Toronto to the boundary of the County of Simcoe, except those portions within the village of Richmond Hill and the town of Aurora.

(2) The Sutton Road, from Yonge Street easterly and northerly to the Ontario County boundary, except those portions within the town of Newmarket and the village of Sutton.

(3) The Kingston Road, from the City of Toronto easterly to the Ontario County boundary.

(4) Dundas Street, from the City of Toronto westerly to the Peel County boundary. On Yonge Street from Lots 91 to 93 inclusive, approximately 0.75 miles of bituminous macadam was laid, 18 feet in width.

On the Sutton Road, what is known as Eagle Street from Yonge Street easterly to the Newmarket limits, approximately 0.75 miles of bituminous macadam, 18 feet in width, was laid. The old narrow road here was widened, the fences moved back, and a great improvement has been made. On Huron Street, from Newmarket to Con. III, 3,000 feet of bituminous macadam were laid. A number of concrete culverts were constructed northerly in the Townships of East Gwillimbury, North Gwillimbury and Georgina.

On the Kingston Road, opposite Lots 1-7, Con. I, Scarboro Township, approximately 1.5 miles of waterbound macadam were laid.

Approximately \$21,700.00 was spent on maintenance and repair work on these 68 miles of Provincial County Roads, or an average expenditure during 1919 of approximately \$319.00 per mile.

On County Roads, 3.95 miles of bituminous macadam, and 5.41 miles of waterbound macadam were laid.

Bituminous macadam using a concrete base was laid in Aurora. Bituminous macadam was laid on Vaughan Road from city limits to Wychwood Avenue—from

Lots 11 to 15, Concession IV, Vaughan—on the Weston Road from city limits—Weston Road south, and also on the Mount Albert Road, opposite Lot 10, Concession VII, East Gwillimbury.

Waterbound macadam was laid on the following sections of County Roads: On the Kennedy Road Townline, Con. VI to Con. VII—on the Weston Road from Woodbridge limits to Lot 12, Con. VII, Vaughan—on the Markham Road, Cons. I, II, III of Markham, and on the Malton Road opposite Con. B, Etobicoke.

A number of culverts, 41 pipe and tile culverts, and 48 concrete culverts, have been constructed on these county roads. Considerable preliminary grading has also been done in preparation for future work.

The Union Bridge in Schomberg, the Cedar Brae Bridge and the Curtis Bridge in King Township, the Vandorf Bridge in Whitechurch Township, and the Gorham Bridge in Newmarket, were constructed during 1919. These are all of neat reinforced concrete design.

A commendable feature in York County has been the erection of neat motor signs, at all the important road intersections. These signs are erected by the County, and space is rented annually. Below the directing signs and advertising space is a small bill board where farmers are allowed to post sale bills. The revenue derived from these signs, after paying for themselves in about three years time, is devoted for miscellaneous expenditure on the highways.

TORONTO, May 12th, 1920.

W. A. McLEAN, ESQ.,

Deputy Minister of Highways, Ontario.

Sir:

I have the honour to submit a report of my inspection of the county road work done in 1919 by the Counties of Essex, Kent, Norfolk, Brant, Northumberland and Durham, Hastings, Prince Edward, Renfrew, and Stormont, Dundas and Glengarry.

A pronounced forward step was taken by nearly all of the counties, but owing to the scarcity and high cost of labour, and difficulty in securing machinery, early expectations of results obtainable were not fulfilled. In some places the authorities were not reconciled to post-war costs and wages, which invariably resulted in lowering the energy put forth by men and teams, especially the latter. It costs more to pay \$5.00 for a one-yard load than it does to pay \$7.00 for a yard and a half. Generally speaking, if even the pre-war efficiency of labour were obtainable, the wages paid last year would have been remarkably cheap in comparison with the amount of currency in the country and with living costs. It would therefore seem that municipalities should not hold back in expectation that construction costs will be lower in the near future.

ARTHUR SEDGEWICK,

Assistant Engineer.

Brant County

As in Norfolk, attention last year was concentrated on high class construction of the leading roads, particularly in the suburbs of Brantford. Owing to gravel being available, and to the experience gained by the city, the preference in this county is for concrete roads. Even with gravel available in the vicinity, this class of surfacing is more expensive than tar-macadam.

The principle piece of work done during the year was the grading, draining and concrete surfacing of the hill on the northern outskirts of the city on road No. 7. The total cost of this half-mile of work was about \$20,000. The pavement varied from 18 to 21 feet in width. The heavy grading, removal of trees, construction of catch-basins and retaining wall, with the high prices prevailing for labour, made this work very costly.

Work was also undertaken on the Mount Pleasant Road, in the southern suburbs of the city. A little more than one-quarter mile of concrete pavement cost nearly \$9,000. Included in this cost was some 600 feet of two foot filling, and 418 feet of 12-inch metal pipe for property entrances.

Some waterbound macadam construction was begun east of St. George. It was intended to lay a double track road, but the delays in stone delivery forced the engineer to restrict the stone to eight feet wide to tide the traffic over until the next year. A mile and a half of grading, and one mile of surfacing was completed. A feature of this piece of work was the use of a mechanical unloader.

One 80-foot bridge was built over the Whiteman Creek, and the road grade through the flats raised. Numerous other small culverts were constructed. A little grading and dragging was done in other parts of the county.

Essex County

In this county construction was not commenced until midsummer. When winter set in about five miles of concrete roadway had been laid in the vicinity of the "Border Cities." The price of this pavement averages \$2.75 per square yard, or \$30,000 per mile, reflecting the unusually high labour costs prevailing in the south-western peninsula. On what is known as the Front Road east of Ford City, the materials were delivered by scows to a dock at the road side, and from there distributed on the road by industrial railway.

The county has purchased another thirty-five acres of gravel pit property, contiguous to the Michigan Central Railroad, and the W.E. and L.S. Railroad. Railroad spurs have been put in and everything is being made ready to ship gravel to the whole of the county roads by rail or motor truck in the coming year. The price paid for the gravel was a thousand dollars per acre, but there is more than sufficient gravel to surface the whole of the county system of roads.

Much of the bridge work remained uncompleted when cold weather set in. A 70-foot span steel bridge was built over the Ruscourt River on the middle road Rochester, and a 76-foot span over the Hillman Creek in Mersea. A number of others, ranging from twelve to twenty feet span are being constructed in various parts of the county. Generally speaking, the cost of concrete for bridge work is high, owing to the long distance gravel or stone has to be hauled.

An endeavour has been made to keep the log-drags working on the clay roads. The farmers, however, to whom this work is entrusted, are not showing the same interest, or have not always the necessary time at their disposal, and in the fall when the roads are in the worst condition and the greatest crop movement is taking place, the dragging is neglected. To be efficient, this is the season when the road-drag should be kept constantly employed.

Hastings County

In this county, with largely increased appropriations, an effort was made to bring the roads in the southern portion back into a reasonable state of repair. Gravel was largely used for resurfacing, but local quarried stone was used for resurfacing near Belleville and Point Ann, quarry stone was used at Shannonville.

In the south a total of some sixty miles of road received a resurfacing, generally of a more or less light character.

In the north twenty-eight thousand dollars (\$28,000.00) was spent on the Hastings Road. On account of the broken nature of the country this is an expensive road to improve. Some of the money was used in an effort to reduce some of the many steep grades. Very little permanent road material is obtainable unless rock crushing machinery is taken in.

About \$15,000.00 was spent reconstructing several concrete bridges from 12 to 32-foot span, which has been held over during the war.

Kent County

No great activity took place in this county last year. The usual amount of bridge and culvert construction was done. Road dragging was not kept up as well as usual for reasons already stated. Some gravel resurfacing was done late in the year.

Two contracts were let for concrete pavements on the Provincial County Road at Wallaceburg, and in the Chatham Suburban Area. There was great difficulty in getting delivery of gravel, so that the work was badly disorganized and retarded. Only 500 feet was laid on the Chatham contract, and one-half mile at Wallaceburg. The contract price at these places was \$2.45 per square yard. Draining and grading is extra. As the plentiful supply of Point Edward gravel is the only hope of the north half of the county getting good roads, it is important that the supply be not restricted.

Norfolk County

Progress in this county was centred on tar-macadam construction of the Provincial County Roads leading south from Simcoe and east from Tilsonburg. The town of Simcoe itself did a considerable amount of this class of construction, and the county completed two miles of 18-foot roadway from the southern limits of the town. Additional grading was done in advance with the expectation of continuing the work to Port Dover in 1920. This work was done by day labour at a cost of about \$18,000.00 per mile for grading and surfacing complete.

Work was also commenced at the county boundary near Tillsonburg, but it was not possible to finish any portion before cold weather.

Work was also begun on tar-macadam for the Main Street in Port Dover, but the shortage of stone prevented the work being completed last year. More than a mile of road has been underdrained on both sides, and the foundation course of stone placed for a total expenditure of \$17,000.00.

The Franklin bridge in South Walsingham, over Big Creek, which was commenced in 1918, was completed, and the approaches raised and graded. Considerable cutting and filling was done on Road No. 9, leading east from the bridge.

New concrete abutments were placed under the bridge at Teeterville, and construction of a new overflow bridge in Con. IX, Walsingham.

With attention being concentrated on these important works it is natural that maintenance and improvement of the remaining road should suffer in comparison. This defect should be righted in succeeding years.

Northumberland and Durham

In this county an endeavour is being made to immediately bring a large mileage of road to a reasonable state of repair with a minimum outlay. Gravel is fairly plentiful and well distributed throughout the county.

With the use of a mechanical tractor and heavy grader, the shoulders were cut off the Provincial County Roads leading north from Port Hope and from Bowmanville, and a considerable amount of gravelling done. A motor truck was purchased for this work, but did not give the results anticipated. The Cobourg to Hastings Road was also put in good shape, and also some patching done on the Trenton to Campbellford road.

The usual annual grants were made to the towns and villages, making a total of \$1,800.00, with which six miles of gravelling was done, and a concrete pavement laid in the subway under the G.T.R. and C.P.R. at Cobourg.

About \$25,000.00 worth of patching and other repairing was done on the remaining county roads.

No bridge construction was undertaken last year.

Prince Edward County

Among the chief works undertaken in this county was the reconstruction of the causeway to Big Island. The causeway which is a half mile long, was raised, widened, fenced and gravelled, and a new wooden culvert constructed over the channel, at a total cost of about \$9,000.00.

One and one-quarter miles of new waterbound macadam construction was partially completed at Glenora, and one mile of double track road was built in the Mount Pleasant section of the Belleville road on a portion which had been particularly bad every spring. In addition to the above, nearly two miles of gravel resurfacing was done on Missassaga Island, and nearly four miles of macadam resurfacing north of Bloomfield.

On the Picton to Trenton Road over four miles of repairing was done in Hillier and Hallowell Townships. On road No. 7, $3\frac{1}{2}$ miles of heavy resurfacing was done from Demorestville south. On road No. 16, $1\frac{1}{4}$ miles of resurfacing was done, and other light maintenance work was performed generally throughout the county.

Renfrew

Delays in delivery of machinery was the cause of this county not getting under way until late in the season. Three separate plants were started at Arnprior, Renfrew and Pembroke.

The road from Arnprior to Braeside was graded for three miles, and a half mile of double track waterbound macadam built. From Arnprior west, a half mile of waterbound macadam was built. The stone quarried at Braeside is inclined to be soft, but can be quarried and delivered on the road in that vicinity at a reasonable cost.

West of Renfrew a quarry was opened up and a large amount of stone taken out and piled ready for the crusher. The stone in this region is extremely hard, which will make it very expensive to work. About one mile of road has been graded. Grading was started at Pembroke and extended south towards the stone quarry, which was opened up at Shady Nook.

On the Provincial County Road one 12-foot arch bridge was built over the Berlanquet Creek in Adamston Township, at a cost of \$7,400.00, and a 16-foot flat slab bridge over the Hennessy Creek in Stafford Township, at a cost of \$9,400.00. In each instance a considerable part of the cost was incurred in grading the approaches.

A 50-foot bridge, with two sidewalks, was built in the Village of Beachburg at a cost to date of \$12,500.00. A 100-foot timber trestle bridge was built at Snake River at a cost reported to date of some \$900.00. Other small bridges were built in other parts

of the county. The approaches to Claybank Bridge, over the Madawaska River, in McNab Township, have been greatly improved at considerable expense. This work was rendered necessary by the slipping away of the former roadway.

Light repairs have been performed generally throughout the system.

Stormont, Dundas and Glengarry

In this county the almost impassability of the roads, especially during the early spring weeks, created a demand for the speedy resurfacing of large mileages and consequently with low mileage costs. During the past year a number of contracts were let and some fifty miles were surfaced with loose crushed field stone. Much of this work will only serve to keep the traffic above the mud until a more permanent surfacing can be applied at some time in the future. At the same time several pieces of more permanent waterbound macadam work were commenced in various parts of the United Counties. These works are serving as object lessons, and there is evidence that more permanent work generally will be demanded.

From Green Valley South three miles, a nine foot waterbound macadam was constructed and Tarvia B was later applied from two miles north of Alexandria, and continued to one and one-half miles south of the same place. The construction of the connecting link in Alexandria was deferred until the coming year. One miles of 12-foot waterbound macadam on an 8-inch cobblestone foundation, was built west of Dalkeith, at a cost of \$12,000.00.

Construction was commenced on the road running north of Maxville. Three miles of 12-foot cobble foundation was laid in the worst part of the road at a cost of \$7,000.00. The road allowance here was only forty feet wide, and it is worth commenting that the property owners donated sufficient land for a 66-foot right of way, and moved the fences back at their own expense.

North of Cornwall one and one-quarter miles of 16-foot waterbound was built at a cost of \$10,000.00, and at Winchester one and one-half miles of 16-foot road for \$17,000.00.

In the Village of South Mountain three-quarter miles of 16-foot macadam was built for \$6,000.00.

The bridge building was restricted to two 25-foot concrete spans on the Provincial County Road north of Cornwall, and several smaller concrete structures in other parts of the county.

W. A. McLEAN, Esq.,

Deputy Minister of Highways, Ontario.

SIR:

I have the honour to submit a brief report on the work carried out on county roads during the year 1919 in the Counties of Lambton, Haldimand, Waterloo, Perth, Oxford, Dufferin, Simcoe, Lennox and Addington, and Leeds and Grenville, in accordance with the provisions of the Highway Improvement Act.

In addition to the regular inspection of the Department, a number of special visits were made during the year at the request of the Road Superintendents.

The various County Councils and Suburban Commissions, as well as Road Superintendents, seemed at all times to appreciate the aid and advice of the Department.

The labour proposition, with one or two exceptions, as in previous years, was the chief factor in retarding work in the several counties. However, considerable new road machinery was bought, and the outlook for increased and improved construction in the near future looks very promising.

Respectfully submitted,

C. W. CORNELL,

Assistant Engineer.

Lambton County

Lambton County Road System was only established in 1918, and consists, up to date of 256 miles of County Roads, and 103 miles of Provincial County Roads.

Extensive road construction has not been undertaken, so far the county apparently contenting themselves with perfecting their organization, constructing bridges and culverts, and adopting a system of maintenance.

The total expenditure on bridges was \$30,363.15, the main item of which was the Wilkesport Bridge, which consisted of two 80-foot steel spans on a concrete substructure, and was completed at a total cost of approximately \$21,312.00.

In the matter of maintenance and repair, the county spent a sum equal to approximately \$105.00 per mile of Provincial County Roads, and \$72.00 per mile of County Roads.

The county suffers to a great extent through the unequal distribution of suitable road material, the north half being fairly well supplied, while the south half cannot obtain adequate supplies without adding very materially to the cost of construction, through the excessive long haul of materials. Negotiations are under way to offset the scarcity of material in the south half of the county, by putting in a siding at Petrolia to connect with fifty acres of gravel purchased at this place. The idea is to transport the gravel in the winter time by rail to the nearest point where construction is to take place the following season.

The organization in this county, while not established on strictly township lines, provides for an adjustment of the expenditure in each township every five years.

Haldimand County

An extensive programme of construction was carried out during the year by the county, the most important of which was the construction of thirteen miles of waterbound macadam roadway, 16 feet wide, and 6 inches thick, between Caledonia and Jarvis. This work was done by contract at a cost of approximately \$7,400.00 per mile, and will serve as a base for a bituminous surface at some future date.

In addition to the above, the county also operated two rock quarries, and had two construction outfits of their own at work; one east of Nelles' Corners on Provincial County Road No. 60, and the other on County Road No. 7, from Selkirk northerly. The work on Provincial County Road No. 60, consisted of the construction of 3.5 miles of waterbound macadam roadway, 16 feet wide and 9 inches thick, from Cayuga westerly, built at a total cost of \$30,290.79, while the work on County Road No. 7 consisted of 4.75 miles of waterbound macadam 10 feet wide and 8 inches thick, from Selkirk northerly, and was built at a total cost of \$23,622.28.

The county has also undertaken quite an extensive programme of grading in preparation for a large mileage of construction next year.

The County System comprises 123 miles, or 13.7 per cent. of the total mileage of the county; of this 53 miles is Provincial County Roads, and 70 miles is County Roads.

It is gratifying to note the practical enthusiasm shown by the different county officials in the good roads movement, and if a system of systematic maintenance is now established on the roads as they are constructed, along with the present rate of construction, it should not be long before the clay roads disappear on the Haldimand County System.

Waterloo County

The County of Waterloo adopted a County Road System some years ago, and to date the system comprises 176 miles of County Roads, 23 miles of Provincial County Roads, and 30 miles of Suburban Area, the total being 26.8 per cent. of the entire road mileage of the county. Some few miles were added to the system this year to provide for continuity.

The principle work undertaken this year was the construction of three miles of concrete road 16 feet wide and 7 inches thick, on Provincial County Road No. 75; one and one-half miles on either side of St. Jacobs. This work was let by contract for the sum of \$1.87 per square yard, the county to do the grading for the sub-grade, and also make the shoulder fill. Approximately 1.25 miles of this concrete roadway was completed this year, and it is the intention to complete the remainder just as soon as weather conditions will permit in the spring.

In addition to the above, 1,076 lineal feet of pavement, 20 feet wide and 7½ inches thick, was laid in the Village of Wellesley at a total cost of \$4,735.88.

The only other work of importance in this county, outside of some small bridges and culverts, was a mile of tar penetration road, built in the suburban area of Galt, and a mile on either side of Fenwood graded and gravelled.

The organization in this county is established on strictly township lines, and while all the work is under the supervision of a county road superintendent, yet with the heavy traffic demands in the centre and southern part of the county, where the prosperous towns and cities are situated, it would seem that the sooner the township system can be done away with the sooner will the real effectiveness of the concrete road policy started, be realized.

Perth County

One of the principal items of construction undertaken in Perth County this year was the construction of 7,756 lineal feet of concrete pavement on County Roads 46 and

47 in the town of Listowel. The streets were paved the full width, and a concrete curb was also constructed on both sides. The Department subsidized the county to the extent of 40% on a width of 16 feet. The work was done by contract at a cost of \$2.10 per square yard, the total cost of the 16-foot width being \$36,331.61. The town itself constructed quite an area of concrete pavement on its main streets in 1917. This work, along with the present construction, gives the town quite a large area of permanently paved streets.

In addition to above, a few small concrete bridges were constructed, and 984 rods of tile laid on Provincial County Roads.

The County Road work consisted chiefly of grading, gravelling and tile draining. In all about 4.43 miles of road graded. 7.83 miles of gravel roads were constructed 8 feet wide, and 6 inches to 8 inches thick, and 155.4 rods of tile drains were laid.

On County Roads 50, 51 and 52, in the town of Mitchell, .88 miles of broken stone road were constructed, 16 feet wide and 10 inches thick.

Dufferin County

This is the third year for this county in the County Road System, having adopted the same in 1917.

The work on Provincial County Roads consisted of the construction of 2.33 miles of crushed stone road, 16 feet wide and 10 inches thick, while on County Roads .8 miles were graded and 1.9 miles of crushed stone road were built 9 feet wide and about 9 inches thick.

The principal item of bridge construction consisted of a 50-ft. span through girder concrete bridge, on Road 19, opposite lot 15, and was built at a total cost of \$3,761.55.

In addition to the above two other smaller bridges were built, one 12-ft. span concrete slab bridge with railing, on road 18, E. ½ concession 5, Amaranth, at a total cost of \$1,365.42; and the other one was a 20-ft. span deck girder bridge with railing, on road 22, opposite lot 26, East Luther, built at a total cost of \$1,578.26.

The County purchased this year two new road rollers and 3 complete crashing outfits, along with a number of road graders and drags. With the new machinery available, the outlook for increased and effective road construction, looks promising.

Simcoe County

Simcoe County's system consists of 451 miles of road; of this mileage 340 miles is county roads, and 112 miles Provincial County Roads.

The principal items of road construction consisted of 3.25 miles of slag and gravel road constructed from the town limits of Midland to the town limits of Penetang. .75 miles of concrete road 20 feet wide, constructed on Provincial County Road No. 73, from Orillia easterly, and one mile of gravel road constructed at Orr's Lake.

The principal items of bridge construction consisted of the Dumford Bridge, a 28-ft. span girder bridge with concrete floor slab and rail, built on the townline of Tay and Matchedash, at a total cost of \$2,500.63. The Tracy Bridge of similar construction on Con. 5 and 6, Adjala, built at a cost of \$2,129.60. The Vesper Bridge, a 30-foot span girder with a concrete floor slab, on lot 2, Con. 8 and 10, Vesper, built at a total cost of \$3,097.53, and the McMaster Bridge, a 40-foot span, concrete beam and slab, on lot 29, Con. 6 and 7, Vesper, built at a total cost of \$5,504.46. In addition to the above the Deadman Bridge, a 60-foot span, was completed, and three other smaller bridges were constructed, ranging from 12 feet to 15 feet in span.

The road at Orr's Lake was in very bad condition, as it was very little above the lake level, and was more or less of a mire hole. They have now graded it about 3 feet above lake level, ditched it and put on a double coat of gravel.

With the exception of the above, and the work in the towns which was covered by grants, very little construction was undertaken, the county contenting themselves with maintaining the roads with the funds available. In fact an elaborate system of construction could not be effectively undertaken until such time as the county obtains adequate road machinery for the purpose, which they do not possess at the present time.

Lennox and Addington

Lennox and Addington's system consists of 76 miles of Provincial County Roads, and 107 miles of county roads, or approximately 24 per cent. of the total road mileage in the area served by county roads.

The County did not undertake very much that could be called construction this year, but contented themselves principally with maintenance and the purchase of new machinery.

The maintenance on Provincial County Roads amounted to approximately \$272.00 per mile while the County road maintenance was approximately \$116.00 per mile.

The new machinery purchased consisted of 2 rock crushers, 1 screen and bin, 2 road rollers, 1 engine and 9 spreading wagons, as well as considerable smaller equipment. The chief drawback in this County is the narrow right-of-way. It will be necessary before effective construction work can be undertaken, especially on Provincial County Roads, that the fences be moved back to give them a clear right of way of 66 feet.

With the road machinery at their disposal, a vigorous road building campaign should be in evidence in this County in the near future.

Leeds and Grenville

Leeds and Grenville system consists of 433 miles of county roads, and 6 miles of suburban roads in Smith's Falls, or a total mileage of 439 miles. The total mileage road in the United Counties is 1,775, therefore, the county road mileage is 24.7 per cent. of the total mileage of the United Counties.

The work in this county this year consisted chiefly of grading and metalling with crushed granite and limestone. Considerable work has also been done in widening and straightening the roads in places, and also in the reduction of grades.

In addition to the above five small concrete bridges were built, ranging in span from 12 feet to 25 feet.

This county, as well as most of the others, has suffered from the scarcity and high price of labour. However, with advent of changed labour conditions along with the unlimited quantities of road material possessed by the county, an extensive road building programme should be in evidence.

Oxford

Oxford's system consists of 250 miles of County Roads and 26 miles of Provincial County Roads, or a total of 276 miles, being 21 per cent. of the total road mileage.

The work in this county consisted chiefly of grading and metalling, the greater part of the material used was crushed gravel, though in a few cases crushed stone was used.

The most extensive improvement consisted of $3\frac{1}{2}$ miles of road graded and partially metalled, on County Road, No. 4, in East Oxford. The grading was completed, but owing to the lateness of the season and bad weather, the metalling was not all completed.

Similar work was undertaken on a number of other roads. In all about 15 miles of road was graded, and about 5 miles metalled, in addition to the ordinary maintenance and repair.

Very good work was also done in scarifying and re-shaping some of the rutted macadam roads.

APPENDIX No. 6

PROVINCIAL HIGHWAYS

W. A. McLEAN,

Deputy Minister of Highways.

SIR.—

In pursuance of provisions of the Provincial Highway Act, I have the honour to submit the attached statements of work and expenditures on Provincial Highways for the year 1919.

All charges included in the several totals cover pay sheets for men and teams, and accounts for materials used in maintenance and construction for the period January 31, 1919, to January 31, 1920, unless otherwise indicated.

Respectfully submitted,

GEO. HOGARTH,

Engineer of Highways.

WENTWORTH COUNTY

Ancaster Township

Maintenance work was carried on through the entire township, and construction work only where it was absolutely essential because of the great difficulty in getting labour. The road was an old worn-out macadam, badly rutted in many places and for the most part without side ditches.

From Dundas turn to the Village of Ancaster, the ditches were deepened and widened and in the cuts it was necessary to do considerable wheeler and slusher work to put in even temporary ditches which were badly needed. West of the Village the cuts were very narrow and these were widened and the necessary ditches constructed, but none of the work was brought up to standard cross-section, as men and teams could be secured only periodically.

The following entrance culverts were put in, and the cost of the pipe was charged to construction and the laying to maintenance as they were not placed in their final location; 450 feet of 12-inch, 15-inch and 18-inch vit. pipe; 320 feet of 8-inch, 10-inch, 12-inch and 14-inch corrugated pipe; 84 feet of 8-inch and 10-inch concrete pipe were cleaned out and relaid. The maintenance charges in connection with laying and relaying entrance culverts, the cleaning out of existing pipe culverts and rebuilding a partially collapsed stone masonry culvert are \$79.60. The construction charges for entrance culverts include the cost of vitrified pipe, which is now in stock for future use, and, in addition to freight and delivery charges, make up a total of \$346.56. In January, 1920, preparations were made for building new culverts on Ancaster grade and expenses incidental to delivery of equipment and materials for this work amounted to \$62.55.

As soon as the road was taken over by the Department, the shoulders were trimmed off and the surface of the road evened up and given a proper crown by the use of an exceptionally heavy road grader pulled by a steam tractor. In addition temporary ditches were constructed by the grader with the result that the general condition of the road was greatly improved. In addition the ditches through the village of Ancaster were cleaned out and the surface of the road patched with crushed stone. This constitutes the maintenance work and the charges amount to \$2,168.03. Approximately 1½ miles were resurfaced without using a roller at cost of \$4,225.11.

Charges amounting to \$81.25 were incurred in connection with delivery of equipment and erection of buildings in preparation for operating Ancaster Quarry.

Construction

	<i>Total Expenditure.</i>	<i>Cost for Township.</i>	
Earthwork	\$3,417 20	\$1,025 16	
Road Surface	4,225 11	1,267 53	
Bridges and Culverts	62 55	18 76	
Side Entrance Culverts	346 56	103 97	
Quarry	81 25	24 37	
	<hr/>	<hr/>	
	\$8,132 67	\$2,439 79	\$2,439 79

Maintenance

Road Surface	\$2,168 03	\$650 41	
Bridges and Culverts	79 60	23 88	
	<u>\$2,247 63</u>	<u>\$674 29</u>	<u>\$674 29</u>
Total Cost for Township.....			<u>\$3,114 08</u>

Saltfleet Township (Queenston Road)

Ditches were excavated on the permanent line to final grade for drainage; the road bed brought up to standard cross section for 2 1-5 miles; 3-5 mile was ditched to final grade on the north side of the road and 3-5 mile ditched on the south side.

The south side of road, where ditches were excavated on that side only, was brought up to final grade and cross section. The total cost of the work was \$6,748.32 and is chargeable to construction.

Forty-seven side entrance culverts (15-inch tile) and eighteen culverts (12-inch tile) were constructed, and in places these were lengthened. One hundred and ninety-three (193) feet tile were put in side road crossings at different points across the township. Three 18-inch tile were encased in concrete with standard head wall, the length of each being 33 feet across the road.

The total cost of this work, including tile on hand, was \$3,268.01, and is chargeable to construction.

The road from the Main Street intersection east was patched continually as required and oiled during the season. Two and three-quarter (2¾) miles were treated twice with refined coal tar and fine stone chips.

Continual dragging and grading with road machine was carried out when necessary.

Stone was put on in fairly large quantities without a roller to build out the present road to proper width.

The total cost of this work, chargeable to construction, was \$5,566.80, and the total to maintenance was \$9,105.49.

Maintenance

	<i>Total Expenditure</i>	<i>Cost for Township.</i>
Road Surface	\$7,199 42	\$2,159 83
Guard Rail	90	27
Oiling	1,906 07	571 82
	<u>\$9,106 39</u>	<u>\$2,731 92</u>

Construction

Earthwork	\$6,478 32	\$1,943 50
Tile and Pipe Draining.....	10 95	3 27
Road Surface	5,566 80	1,670 04
Bridges and Culverts	2,044 62	613 39
Side Entrance Culverts	1,201 49	360 45
	<u>\$15,302 18</u>	<u>\$4,590 65</u>
Total Cost for Township.....		\$7,322 57

Barton Township

The road was resurfaced with stone without a roller for ¼ mile at the west end of the township on Main Street.

Maintenance

	<i>Total Expenditure.</i>	<i>Cost for Township.</i>
Road Surface	\$820 40	\$246 12

Summary for Wentworth County

	Construction	Maintenance	Total	30 % Payable by County
	\$ c.	\$ c.	\$ c.	\$ c.
Saltfleet, Twp.....	15,302 18	9,106 39	24,408 57	7,322 57
Barton " 		820 40	820 40	246 12
Ancaster " 	8,132 67	2,247 63	10,380 30	3,114 08
	23,434 85	12,174 42	35,609 27	10,682 77

LINCOLN COUNTY

Township of Clinton

Ditches were built on both sides of the road, which was graded to final cross-section for 3 9-10 miles across the township, earth from ditches being used to build up shoulders of road.

Two knolls were cut down and a slight fill made to even grade.

In one place a fill of about 3 feet was made, and a long stretch of road cut down to grade. One point was cut off to improve the vision, which is now good. The cost of this work was \$23,939.62.

Eighty side entrance culverts were built; also some 8-inch galvanized pipe where the tile could not be used. Two 3 x 2 standard concrete culverts were built, to replace old culverts in poor condition. The total cost of this work, \$3,475.92, is chargeable to construction.

Macadam foundation and surface were put down over 2½ miles of road where grading had already been completed. A heavy rubble foundation was laid where knolls had been reduced and a small fill made.

The road was patched as required during the season, and oiled, a coat of screenings being put on the oil.

The rubble foundation was taken out of Sutton's Quarry by the Department.

The total cost of construction on this work was \$40,552.23, which includes about 18,000 tons of stone stored at Beamsville for construction. Maintenance charges are \$5,491.20.

Maintenance

	<i>Total Expenditure.</i>	<i>Cost for Township.</i>
Road surface	\$3,541 76	\$1,062 53
Removing snow, etc.	30 28	9 08
Oiling	1,919 16	575 75
	<u>\$5,491 20</u>	<u>\$1,647 36</u>

Construction

Earthwork	\$23,939 62	\$7,181 89
Tile and pipe draining	36 00	10 80
Road surface	40,140 51	12,042 15
Bridges and culverts	3,111 67	933 50
Guard rail	3 00	90
Side entrance culverts	325 25	97 58
Hauling	5 07	1 52
Rockwork	403 65	121 09
	<u>\$67,964 77</u>	<u>\$20,389 43</u>

Total cost for township \$22,036 79

Township of Grantham

The road was ditched and brought up to standard cross-section for $\frac{3}{4}$ mile, and ditches were excavated on the south side of the road for $\frac{1}{2}$ mile. Heavy fills were made and brought up to grade and final cross-section. Cuts taken out and grades reduced. Some fairly heavy cuts and fills were made in the township. The total cost of this work was \$11,371.72.

Seven entrance culverts were put in and two large culverts extended. One 18-inch pipe was enclosed in concrete with head-walls. The total cost of this work was \$2,691.15.

The road surface was patched continually and well oiled during the season.

Macadam foundation and surface was laid for about one mile, and foundation of stone put on fills and cuts east of St. Catharines. The road west of St. Catharines, where stone was put on, was rolled, and east of St. Catharines was not. The total cost of the work was: Construction, \$17,078.82; Maintenance, \$5,871.06.

Maintenance

	<i>Total Expenditure.</i>	<i>Cost for Township.</i>
Road surface	\$4,559 11	\$1,367 73
Removal of snow	32 70	9 82
Oiling	1,279 25	383 77

Construction

Earthwork	\$11,371 72	\$3,411 52
Road Surface	17,078 82	5,123 65
Bridges and culverts	2,474 05	742 21
Side entrance culverts	217 10	65 13
	<hr/>	<hr/>
	\$31,141 69	\$9,342 51

Total cost for township \$11,103 83

Township of Grimsby

Ditches were excavated to final grade for $2\frac{1}{4}$ miles on the south side of the road, and the earth was used to build up the shoulders of the road on that side to final cross-section. One-quarter mile was ditched on the north side. The total cost of this work, which is chargeable to construction, is \$5,062.29.

One 2 x 2 standard concrete culvert was built and 31 side entrance culverts put in. In some places these were lengthened on account of the H. G. & B. Railway being close to the ditch. One hundred and fifteen feet extra tile were required at stops 135 and 137, H. G. & B. Railway.

Ten galvanized iron pipes were put in at temporary side entrances, to insure drainage where road was not to final grade. The total cost of this work was \$1,157.09, and is chargeable to construction.

Stone was put on the road without a roller in some places to widen the present surface and to be used as a foundation, and in addition to this $\frac{3}{8}$ mile of foundation and surface was put in and rolled at the east end of the township. The road surface required a great deal of patching and resurfacing, which was done as required. The road through the township was oiled, in some sections twice during the season, screenings being used to hold the oil.

The cost of the work chargeable to construction was \$5,536.23, and to maintenance \$7,960.11. Guard rails were maintained at the cost of \$5.70.

Maintenance

	<i>Total Expenditure.</i>	<i>Cost for Township.</i>
Road surface	\$6,163 96	\$1,849 19
Bridges and culverts	2 90	87
Guard rails	2 80	84
Oiling	1,796 15	538 84
	<hr/>	<hr/>
	\$7,965 81	\$2,389 74

Construction

Earthwork	\$5,062 29	\$1,518 69
Tile and pipe draining	84 50	25 35
Road surface	5,536 23	1,660 88
Bridges and culverts	468 00	140 40
Guard rails	35 50	10 66
Side entrance culverts	604 59	181 35
	\$11,791 11	\$3,537 33

Total cost for township **\$5,927 07**

Township of Louth

Ditches were excavated on both sides of the road, and the road brought up to final grade and cross-section for $1\frac{3}{8}$ miles. Several fills were raised and knolls cut down to improve grades. Two and one-eighth ($2\frac{1}{8}$) miles of ditches were constructed on the south side of the road, and that side of the road brought to final grade and cross-section. Total cost of this work, which is chargeable to construction, is \$13,632.91.

Four standard 2 x 2 concrete culverts were completed, and one 14 x 6 concrete culvert started, but not completed.

Seventeen (17) side entrance culverts were built to allow our ditches to carry water on. Culverts were cleaned out. The cost of this work was \$7,250.65, which is chargeable to construction, and \$7.91, chargeable to maintenance.

Macadam foundation and surface were laid over $1\frac{1}{8}$ miles of road at the east end of the township. Stone was put on the road near Jordan without a roller. This road was patched continually all season as required, which was often, considerable resurfacing being necessary. Oil was used in the west of township to within $1\frac{1}{2}$ miles of the east end. The total cost of this work chargeable to construction is \$21,654.75, and cost chargeable to maintenance was \$7,887.42.

Maintenance

Total Expenditure. Cost for Township.

Road surface	\$6,404 33	\$1,921 30
Bridges and culverts	7 91	2 38
Guard rail	16 78	5 03
Patrol	32 20	9 66
Oiling	1,434 11	430 23
	\$7,895 33	\$2,368 60

Construction

Earthwork	\$13,632 91	\$4,089 87
Road surface	21,654 75	6,496 43
Bridges and culverts	6,975 20	2,092 56
Guard rail	45 83	13 75
Side entrance culverts	275 45	82 63
	\$42,584 14	\$12,775 24

Total cost for township **\$15,143 84**

Summary for Lincoln County

	Construction	Maintenance	Total	30% Payable by County
	\$ c.	\$ c.	\$ c.	\$ c.
Clinton, Twp.	67,964 77	5,491 20	73,455 97	22,036 79
Grantham, Twp.	31,141 69	5,871 06	37,012 75	11,103 83
Grimsby, Twp.	11,791 11	7,965 81	19,756 92	5,927 07
Louth, Twp.	42,584 14	7,895 33	50,479 47	15,143 84
Niagara, Two.	14,552 33	4,557 37	19,109 70	5,732 91
	168,034 04	31,780 77	199,814 81	59,944 44

BRANT COUNTY

Brantford Township

From the Ancaster Township line to the city of Brantford the road was of clay, with but very little road metal, and during the wet weather it was very difficult to keep it in a passable condition. This was especially so in the cuts which, owing to lack of drainage, became deeply rutted and with numerous sink holes. Between Brantford and Paris conditions were vastly better, as the gravel road was in fairly good condition. West of Paris the road was also in fair shape for traffic.

There is considerable heavy earth grading to be done in this township, but east of Brantford no construction work of bringing the road up to standard cross-section was undertaken, owing to lack of labor and teams. The cuts which were narrow were widened and temporary ditches constructed, and the earth, which was removed by wheelers and slushers, was used in widening the adjacent fills. Between Brantford and Paris several heavy cuts were partially taken out but not completed, as widening had not been secured. Scott Hill cut was taken out, but the ditches were not entirely completed before the frost came. Northerly from Scott Hill for three-quarters of a mile the ditches were taken out to grade, and the earth used to build up the shoulders and bring the road up to standard cross-section. The total cost of all this earthwork was \$7,404.93.

Existing pipe culverts were cleaned out and extended where fills were widened. Temporary farm entrances were put in the temporary side ditches where needed. A total of 160 feet of 18-inch and 15-inch vitrified pipe was used for this purpose, and also 160 feet of 6-inch was used through Echo Place, where only shallow ditches could be put in. In addition, 194 feet of 8-inch and 68 feet of 12-inch concrete entrance pipes were taken up, cleaned out and relaid. The total labor charges for this work amounted to \$59.35. Where the road was graded to standard cross-section and ditches completed, 48 feet of 15-inch vitrified pipe entrances were laid, and the charge for this, together with the cost of the pipe that was laid temporarily and that of a considerable quantity of 15-inch and 18-inch vitrified pipe now in stock, was \$305.62.

For the entire distance through the township the road was graded, crowned and temporary ditches constructed with a road grader, and the road kept in shape thereafter by the use of road drags. Through Echo Place and Cainsville $2\frac{1}{2}$ miles of road were treated with asphaltic oil to keep down the dust, which was excessive. From time to time the dust was removed from the shallow side ditches in these villages, the catch basins cleaned out and the road surface patched. Between Brantford and Paris the gravel road was cleared of dust and two cars of asphaltic oil applied. The total cost of this maintenance road surfacing was \$4,197.30. For approximately $1\frac{1}{2}$ miles in Echo Place and Cainsville the road was surfaced with gravel, and near Paris, to the north of Scott Hill, approximately $\frac{1}{4}$ of mile of new fill was gravelled. The total cost of this was \$3,037.86.

Through the entire township the weeds were kept cut at an expenditure of \$184.52.

Construction

	<i>Total Expenditure.</i>	<i>Cost for Township.</i>
Earthwork	\$7,404 93	\$2,221 48
Side entrance culverts	305 62	91 68
Road surface	3,037 86	*911 36
	<hr/> \$10,748 41	<hr/> \$3,224 52

Maintenance

Road surfacing	\$4,197 30	\$1,259 19
Side entrance culverts	59 35	17 80
Cutting weeds, etc.	184 52	55 35
	<hr/> \$4,441 17	<hr/> \$1,332 34

Total cost for township	\$4,556 86
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Brantford and South Dumfries

The road in this section is the boundary line between the two townships, and was of gravel construction with a fairly good traffic surface, but inadequate side ditches.

The sod was removed for the entire distance on both sides of the road where the ditches were to be constructed, and the ditches partially taken out and the earth hauled in wagons to make the fill to the east of the G. T. R. subway. The cost amounted to \$557.50.

Five 15-inch side entrance culverts were put in, at an expenditure of \$42.12.

The road was crowned and temporary ditches put in with a road grader and also with asphaltic oil, at a cost of \$104.79. A fill east of the G. T. R. subway was gravelled for about an $\frac{1}{8}$ of a mile at an expenditure of \$248.45.

Construction

	<i>Total Expenditure.</i>	<i>Cost for township.</i>
Earthwork	\$557 50	
Road surface	248 45	
Side entrance culverts	42 12	
	<hr/>	<hr/>
	\$848 07	\$254 42

Maintenance

Road surface	\$104 79	\$31 43
Cost for township		<hr/>
		\$285 85

Burford Township

The portion of the Highway in the township is less than a mile long, and the only work of any extent carried on was starting work on the erection of the Faulkland culvert.

The only work of this class was the removal of a considerable number of trees in the vicinity of Faulkland culvert, at a cost of \$35.50.

The gravel road was shaped up, given a crown and grader ditches constructed, and kept in shape by the use of a road drag at an expenditure of \$51.75.

The footings for the Faulkland culvert were taken out and some of the materials hauled for its construction. Cost of labour and materials, \$833.46.

Construction

	<i>Total Expenditure.</i>	<i>Cost for township.</i>
Earthwork	\$35 50	\$10 65
Bridges, 7 culverts	833 46	250 04
	<hr/>	<hr/>
	\$868 96	\$260 69

Maintenance

Road surface	\$51 75	\$15 52
Total cost for township		<hr/>
		\$276 21

Blenheim and Burford Townships

The road which is the dividing line between these two townships was of very light gravel construction, with no crown, the grade narrow, and without ditches or very inadequate ones. Through several swampy places the roadbed had to be raised to secure proper drainage.

At Eatonia two cuts were taken out with wheelers and slushers, and the material used to raise the adjacent fills to grade. The ditches were also taken out on both sides and the road brought up to standard cross-section for $\frac{1}{4}$ mile, and another $\frac{1}{4}$ mile of grading was only partially completed. From Princeton Corner nearly to Creditville, with the exception of the cuts on either side of Princeton Creek, the road was graded and ditched to standard cross-section for a total distance of four miles. The cost for this construction work was \$15,627.65.

The steel bridge over Princeton Creek was replanked with 3-inch plank, at an expenditure of \$225.97. A total of 1,042 feet of side entrance culverts of 8-inch, 12-inch, 15-inch and 18-inch vitrified pipe were put in, and an additional 200 feet of 24-inch and 18-inch vitrified pipe used to extend existing pipe culverts under the roadbed. The cost of this work was \$1,800.52, and includes a considerable number of vitrified pipe on hand for future use.

From the easterly limits of Princeton Corner, about four miles, the road was crowned and grader ditches constructed. An additional mile at the west end was similarly treated, and the total cost of the five miles of this work was \$409.96. From Princeton Corner westerly the new grade was gravelled for nearly $\frac{2}{3}$ of a mile, at a cost of \$987.73.

The weeds and small brush along the road for the entire length of the township were cut at a cost of \$61.25.

In a number of cuts the earth was removed from around the poles, and this necessitated the lowering of them at an expenditure of \$22.80.

Construction

	Total Expenditure	Cost for Township	
Earthwork	\$15,627 65		
Bridges and Culverts	1,800 52		
Road Surface	967 73		
Telephone Repairs	22 80		
	<u>\$18,418 70</u>	<u>\$5,525 61</u>	<u>\$5,525 61</u>

Maintenance

Road Surface	409 96		
Bridges and Culverts	225 97		
Cutting weeds	61 25		
	<u>697 18</u>	<u>\$209 15</u>	<u>209 15</u>
			<u>\$5,734 76</u>

Total cost for Blenheim Twp.....\$2,867 38

Total cost for Burford Twp..... 2,867 38

Summary for Brant County

	Construction	Maintenance	Total	30% Payable by County
	\$ c.	\$ c.	\$ c.	\$ c.
Brantford, Twp.....	10,748 41	4,441 17	15,189 58	4,556 87
Brantford " and (S. Dumfries).....	424 03	52 40	476 43	142 93
South Dumfries and (Brantford).....	424 04	52 39	476 43	142 92
Burford, Twp.	868 96	51 75	920 71	276 21
Burford " (Blenheim).....	9,209 35	348 59	9,557 94	2,867 38
	<u>21,674 79</u>	<u>4,946 30</u>	<u>26,621 09</u>	<u>7,986 31</u>

OXFORD COUNTY

Blandford and E. Oxford

The easterly two miles of this section the road is clay, without any road metal for the greater part of the distance, and consequently in wet weather it was almost impassable. From Eastwood westerly for two miles there is a water-bound macadam road in fair condition, but for the remaining two miles to Woodstock the old macadam road was badly rutted and worn out.

From Eastwood easterly for one-quarter of a mile ditches were constructed and material removed used to widen the shoulders and bring the grade up to standard cross-section. For another half-mile easterly similar work was carried on, but was not completed. In addition a considerable amount of clearing was done. Total expenditure, \$658.60.

Several pipe culverts under the road were cleaned out and put in proper condition at an expenditure of \$6.00. A total of 82 feet of 8-inch vitrified pipe entrance culverts were put in the completed ditches and, with the cost of vitrified pipe on hand for future use, the expenditure amounted to \$326.61.

From the easterly limits to Eastwood the road was crowned and grader ditches constructed. From Eastwood to Bonn's Corners the existing side ditches were cleaned out and improved with the road grader. For the remainder of the distance to Woodstock the old macadam road was in very bad shape, but by using the grader the top of the road was shaved off, and this material was used in filling the ruts and there consolidated by the traffic. The shoulders, which were higher than the roadway, were then cut off and thrown outside of the temporarily constructed grade ditches by the use of the road grader, with the result that the roadway was greatly improved. In addition a considerable quantity of crushed stone was piled at convenient places between Eastwood and Bonn's Corners, and part of it used to patch the macadam road, and the remainder will be used for the same purpose, as needed. Total expenditure on this maintenance work was \$782.73. The completed new grade was surfaced with crushed stone and a quantity piled for future use. Total cost, \$1,039.46.

The weeds and small brush along the road were cut at a cost of \$65.00.

Construction

	Total Expenditure	Cost for Township	
Earthwork	\$658 20		
Road Surface.....	1,039 46		
Side Culverts.....	326 61		
	<hr/>		
	\$2,024 27	\$607 28	\$607 28

Maintenance

Road Surface.....	782 73		
Culverts.....	6 00		
Cutting weeds.....	65 00		
	<hr/>		
	\$853 73	\$256 11	256 11
			<hr/>
			\$863 39

Total cost for East Oxford Twp.... \$431 69

Total cost for Blandford Twp..... 431 70

West Oxford

For the entire distance between Woodstock and Ingersoll, with the exception of the portion in Beachville, the road was in very bad shape. Sections of it had recently been gravelled, but not properly spread before being consolidated by traffic, and the remainder was very much in need of proper patching and resurfacing. Drainage, especially on the south side between the radial and the road, was either entirely inadequate or there was none at all.

Between Woodstock and Beachville it was necessary to remove considerable earth by wagons to bring the road to grade, and excavate ditches. From Beachville to Woodstock considerable difficulty was encountered in construction because of the number of boulders it was necessary to excavate by hand. Over the entire section the trees and brush were cleared from the right-of-way. Total cost of work, \$8,510.71.

The entire road, with the exception of through Beachville, was gone over with the road grader and rounded into proper shape. Through Beachville the ditches were cleaned out and the surface patched as needed. Temporary side entrances were put in and gravelled for protection, as the ditches were very shallow next to the radial tracks. West of Beachville the grader was used in putting the road surface in shape and in constructing temporary ditches. The road, except through Beachville, was frequently dragged and kept in shape with a three-section road drag, used as one unit and as individual units with excellent results. A mile and a quarter of the road in Beachville was treated with asphaltic oil. Total cost of this maintenance work was \$2,153.95. East of Beachville $\frac{3}{4}$ mile of the road was gravelled, and west of the village of $1\frac{1}{4}$ miles, at a cost of \$992.22.

The numerous pipe culverts under the road were cleaned where necessary, and eleven of them extended with vitrified pipe. The temporary pipe culverts, one 12-inch—30 feet long, and one 15-inch—40 feet long of vitrified were put in. Total expenditure on this maintenance work, \$43.90. In addition 762 feet of entrance culverts of 6 feet—8-inch, 12-inch, 15-inch and 18-inch vitrified pipe were put in, and a considerable stock of vitrified pipe is still on hand for future use. Total cost, including pipe in stock, \$452.38.

The weeds and small brush were cut and kept out in the right-of-way at a cost of \$96.25.

Construction

	Total Expenditure	Cost for Township	
Earthwork	\$8,510 71		
Road surface.....	992 22		
Culverts.....	452 38		
	<hr/>		
	\$5,955 31	\$2,986 59	\$2,986 59

Maintenance

Road surface	2,153 95		
Bridges and Culverts.....	43 90		
Cutting weeds	96 25		
	<hr/>		
	\$2,294 10	\$688 23	688 23
			<hr/>
	Total cost for Township.....		\$3,674 82

North Oxford

The road in this township was in fair shape with the exception of the easterly end, which has become badly rutted. The under-drainage was exceptionally good, there being a line of tile on each side of the road for entire distance, and for the most part the road was sufficiently high to give good surface drainage.

The westerly three-quarters of a mile in this township was graded to standard cross-section, but was not entirely completed. A large cut about one-half mile east of the village of Thamesford was taken out, and the material used in making the fill at the Thamesford turn, to permit an increased radius of curvature. Cost of work, \$2,606.51.

The shoulders of the road were trimmed off and the road smoothly graded, and the large surface stones raked off. Sections previously gravelled were very wavy, and this condition was improved as much as possible. Road drags were used as much as possible to keep the road from rutting and to a proper crown. Two and one-half miles of the road were treated with asphaltic oil. Total maintenance expenditure, \$949.39. The easterly mile in the township was gravelled also two-thirds of a mile west of Dickenson's corner and one-eighth of a mile east of Thamesford. Total cost of this work was \$1,970.92. A 42-foot 24-inch vitrified pipe culvert was put in, and in addition 80 feet of 12-inch vitrified entrance culverts. Cost was \$31.73.

The weeds along the road were kept cut at a cost of \$50.10.

Construction

	Total Expenditure	Cost for Township	
Earthwork	\$2,606 51		
Road surface.....	1,970 92		
Culverts.....	31 73		
	<hr/>		
	\$4,609 16	\$1,382 75	\$1,382 75

Maintenance

Road surface.....	\$949 39		
Cutting weeds	50 10		
	<hr/>		
	\$999 49	\$299 85	299 60
			<hr/>
	Total cost for Twp.....		\$1,682 35

North Oxford and East Nissouri

A large portion of this section is through the village of Thamesford, and the gravel road was, for the most part, in good travelling condition.

To the west of the village the road was greatly improved by using a road grader to smooth out the ruts and to cut off the shoulders of the road, which in many places were too high. A road drag was then used to keep it in good shape. About a mile of the road west of the village was treated with asphaltic road oil. Total cost of this maintenance work was \$373.98. Three sections, making a total of half a mile, were gravelled at a cost of \$375.83.

The weeds along the road were kept cut at an expenditure of \$18.75.

Construction

	Total Expenditure	Cost for Township	
Road surface.....	\$375 83	\$112 75	\$112 75

Maintenance

Road surface	\$373 98		
Cutting weeds	18 75		
	<hr/>		
	\$392 73	\$117 82	117 82
			<hr/>
			\$230 57
Total cost for North Oxford Twp.....			\$115 28
Total cost for East Nissouri Twp.....			115 29

East Nissouri and North Dorchester

Only maintenance work was done on this section, as the gravel road was in fair travelling condition.

The shoulders of the road were removed with a road grader, and afterwards kept in shape by the use of a road drag. A light coat of asphaltic road oil was applied to keep down the dust. Gravel was used to patch the road surface as needed. Cost of the work, \$103.94.

Weeds were cut at a cost of \$3.25.

Maintenance

	Total Expenditure.	Cost for township.
Road surface	\$103 94	
Cutting weeds	3 25	\$32 16
	<hr/>	
	\$107 19	
Total cost for East Nissouri Township		\$16 08
Total cost for North Dorchester Township		\$16 08

Summary for Oxford County

	Construction	Maintenance	Total	30% Payable by Municipality
	\$ c.	\$ c.	\$ c.	\$ c.
Bleoheim, Twp.....	9,209 35	348 59	9,557 94	2,867 38
Blandford, "	1,012 13	426 87	1,439 00	431 70
Oxford, E "	1,012 14	426 86	1,439 00	431 69
West Oxford, Twp.....	9,955 31	2,294 10	12,249 41	3,674 82
North Oxford "	4,609 16	999 49	5,608 65	1,682 60
North Oxford "	187 92	196 37	384 29	115 29
East Nissouri "	187 91	196 36	384 27	115 28
East Nissouri.....	<hr/>	53 60	53 60	16 08
	26,173 92	4,942 24	31,116 16	9,334 94

MIDDLESEX COUNTY**East Nissouri and North Dorchester**

Only maintenance work was done on this section as the gravel road was in fair travelling condition.

The shoulders of the road were removed with a road grader and afterwards kept in shape by the use of a road drag. A light coat of asphaltic road oil was applied to keep down the dust. Gravel was used to patch the road surface as needed. Cost of the work, \$104.94.

Weeds were cut at a cost of \$3.25.

Maintenance

	<i>Total Expenditure.</i>	<i>Cost for Township.</i>
Road surface	\$103 94	
Cutting weeds	3 25	
	<hr/>	<hr/>
	\$107 19	\$32 16
Total cost for East Nissouri Township, \$16.08.		
Total cost for North Dorchester Township, \$16.08.		

West Nissouri and North Dorchester

From the easterly limits of Doty's Creek the gravel road was in fairly good shape, but between Doty's Creek and Crumlin the roadway was of extra width, and as the shoulders were higher than the travelled road it became badly rutted.

Through the swamp from the fence lines to the edges of the road there was a thick growth of trees and underbrush, and this was cleared at a cost of \$137.80.

From Doty's Creek to Crumlin the work of removing the shoulders of the road which were too high with a road grader was not entirely completed. Before gravelling this section the old, badly rutted road surface was scarified and evened up with the road grader. East of Doty's Creek the road was kept in shape by use of road drags. Total cost of maintenance, \$276.22. For the entire distance the road was gravelled at a cost of \$5,218.24.

The cost of cutting the weeds along the road amounted to \$7.50.

Construction

	<i>Construction.</i>	<i>Cost for Township.</i>
Road surface	\$5,218 24	
Earthwork	137 80	
	<hr/>	<hr/>
	\$5,356 04	\$1,606 81

Maintenance

Road surface	\$276 22	
Cutting weeds	7 50	85 11
	<hr/>	<hr/>
	\$283 72	\$1,691 92
Total cost for West Nissouri Township, \$845.96.		
Total cost for East Dorchester, \$845.96.		

Township of London

In this section the width of the road is from 30 to 40 feet, and the gravelled surface was very badly rutted, thus preventing the surface water from reaching the ditches. The result was that the road was in a very bad shape for traffic.

Just east of the concrete bridge at London a cut was taken out of the roadway and the material used to raise and widen the fill at the bridge. Ditches on both sides of the road for one-third of a mile were put in. Cost of this work amounted to \$984.35.

The old gravelled road was scarified and then smoothed and rounded into proper shape with a road grader. A road drag was used to keep it in proper condition. Cost of maintenance work was \$513.81. For the entire length of this section after the road was scarified and smoothed, it was gravelled, and the westerly half was consolidated with a road roller. Total cost was \$5,766.80.

The existing pipe culverts under the road were cleaned out at a cost of \$6.30. A total of 240 feet of 15-inch and 18-inch vitrified pipe entrance culverts were put in, costing \$125.29.

The guard rail along fill by concrete bridge east of London was repaired at an expenditure of \$3.32.

The cost of cutting the weeds along the road amounted to \$14.55.

Construction

	<i>Total Expenditure.</i>	<i>Cost for Township.</i>
Earthwork	\$984 35	
Road surface	5,766 80	
Culverts	125 29	
	<u>\$6,876 44</u>	<u>\$2,062 93</u>

Maintenance

Road surface	\$513 81	
Bridges and culverts	6 30	
Guard rail	3 32	
Cutting weeds	14 55	
	<u>\$537 98</u>	<u>\$161 39</u>
Total cost for Township.....		<u>\$2,224 32</u>

Summary for Middlesex County

	Construction	Maintenance	Total	30% Payable by County
	\$ c.	\$ c.	\$ c.	\$ c.
N. Dorchester (E. Nissouri) Twps.....	53 59	53 59	16 08	
W. Nissouri and N. Dorchester, Twps....	5,356 04	283 72	5,639 76	1,691 92
London, Twp.....	6,876 44	537 98	7,414 42	2,224 32
	<u>12,232 48</u>	<u>875 29</u>	<u>13,107 77</u>	<u>3,932 32</u>

COUNTY OF ONTARIO**Pickering Township**

West from Rouge Bridge to the top of Rouge Hill, a distance of fifteen hundred feet, very heavy grading was completed. Bad winds in the road were straightened, the grades were reduced and visibility given across the Rouge Valley. East of the Rouge the road was ditched and widened for six hundred feet. From Petticoat Creek east for half a mile the highway was ditched and graded to a width of thirty feet. Heavy grading was carried out on the hill east of Petticoat Creek and grades were raised in front of Holmes farm. From Dunbarton church east for seven-tenths of a mile, the road was ditched and graded; grade was reduced on the hill west of Liverpool Corners. From the east side of Bunker's Hill west for half a mile, the road was widened to thirty feet, ditched and grades reduced. This work involved heavy earthwork and rock work at Bunker's Hill and in front of Allison's farm. About a quarter of a mile east of Bunker's Hill eight hundred feet of the road was widened and a sharp knoll reduced at the cross-road. Very heavy earthwork was completed at Eagle Hill, where grades were reduced from 7.5% to 5% and a mile of highway was widened and ditched. The creek, west of Eagle Hill, was diverted for four hundred feet to allow for widening the road. From Whitby township line west for one mile, the road was ditched and widened. The total cost of the above earthwork was \$51,031.60.

Crushed stone was brought in from Point Anne Quarries and a coat of stone 5 inches deep and 20 feet wide has been hauled on 3.22 miles of road and a large quantity of stone is now stored for next season's work. A heavy coat of gravel was placed on 4.5 miles of highway. The total cost of this work was \$38,456.16.

Eight concrete culverts were installed under the highway as follows:

One 4 x 3 x 50.

One 17 x 7 x 33.

One 6 x 4 x 36.

One 17 x 7 x 58ft. 6in.

One 3 x 3 x 45.

One 10 x 6 x 39ft. 6in.

Two 18in. pipe culverts with 6in. concrete box reinforcement 40ft. long.

Independent telephone poles were moved off the new grading at Rouge Hill, Pickering Bridge, Bunker Hill and Eagle Hill. A total of 1.2 miles were moved at a cost of \$493.74.

Thirty-three culverts were installed under side entrances and side roads. This includes two 24in. galvanized iron pipe culverts 20 feet long, one 30in. galvanized 24 feet long, six hundred and ninety-three feet of 15in. vitrified pipe and two hundred and eighty-six feet of 18in. vitrified pipe. The total cost of these culverts was \$1,045.75.

Sufficient 18in. tile (vitrified) is on hand for the drainage of Rouge Hill. This tile cost \$1,423.10.

The maintenance charges cover the cost of placing a light coat of gravel on 1¼ miles of road, dragging the whole road, cutting the shoulders off the road in several places with the grader, and weed cutting. Floors of culverts at Liverpool Corner and Flemings were repaired.

Construction

	<i>Total Expenditure.</i>	<i>Cost for Township.</i>
Earthwork	\$51,031 60	\$15,309 48
Rockwork	150 00	45 00
Road surface	38,456 16	11,536 85
Bridges and culverts	13,145 27	3,943 58
Moving poles	493 74	148 12
Side entrance culverts	1,045 75	313 73
Tile and pipe draining	1,423 10	426 93
	<hr/> \$105,745 62	<hr/> \$31,723 69

Maintenance

Road surface	\$1,390 58	\$417 17
Bridges and culverts	37 90	11 37
Cutting weeds	34 50	10 35
	<hr/> \$1,462 98	<hr/> \$438 89
Total cost for township		<hr/> \$32,162 58

Pickering Village

Two coats of oil were placed on the highway through the village at a total cost of \$539.45.

	<i>Total Expenditure.</i>	<i>Cost for Village.</i>
Road surface	\$539 45	\$161 83

Whitby Town

A heavy coat of gravel was placed on one and eight-tenths miles of the highway assumed inside the town limits. Hydro-Electric poles were moved off the new grading.

The total length of road assumed inside the town was scarified, levelled and consolidated with a steam-traction outfit and four thousand feet of the highway was oiled.

Construction

	<i>Total Expenditure.</i>	<i>Cost for Towns.</i>
Road surface	\$1,307 03	\$392 11
Moving poles	31 96	9 59
	<hr/> \$1,338 99	<hr/> \$401 70

Maintenance

Road surface	\$725 58	\$217 67
Total cost for town.....		\$619 37

East Whitby Township

The highway was ditched and graded for a distance of 1,200 feet east from Oshawa town line, at a cost of \$493.00.

Two and eight-tenths miles of highway were gravelled at a cost of \$3,095.95.

Two-side entrance culverts were installed, and pipe is on hand for next year's work. The cost of this pipe was \$258.65.

A concrete culvert, 6 x 5 x 66 feet long, was constructed west of Oshawa Cemetery, and the excavation work for a culvert near Harmony was completed. The total cost of this work was \$2,667.19.

Two and one-quarter miles of highway were patched and oiled. Culverts and guard rails were kept in repair and weeds were cut.

Construction

	<i>Total Expenditure.</i>	<i>Cost for Township.</i>
Earthwork	\$493 08	\$147 92
Road surface	3,095 95	923 73
Bridges and culverts	2,667 19	800 16
Side entrance culverts	258 65	77 60
	\$6,514 87	\$1,954 46

Maintenance

Road surface	\$1,104 70	\$331 41
Bridges and culverts	67 50	20 25
Guard rail	25 61	7 68
Cutting weeds	9 75	2 93
	\$1,207 56	\$362 27

Total cost for township **\$2,316 73**

West Whitby Township

From Pickering Township line east for eight-tenths of a mile, the highway was ditched, graded and the grades reduced. The cost of this earthwork was \$3,224.60.

Crushed stone was brought in from Point Anne Quarries and an 8 in. coat 20 feet wide was placed on the road for a distance of nineteen hundred feet. A coat of gravel 6 inches deep and 16 feet wide was placed on one mile of the highway. The total cost of this road surfacing was \$6,202.11.

Two concrete culverts, one 4 x 3 x 33 and one 3 x 3 x 33, were constructed about half a mile west of Whitby town line. These culverts replaced two wooden culverts which were in very bad condition. The total cost of these culverts was \$1,549.40.

Four vitrified tile culverts were installed under side entrances, and one culvert under a side road. A total of 112 feet of 15-inch vitrified tile pipe was installed, at a cost of \$193.33.

Maintenance charges cover the cost of scarifying and rolling about one mile of highway and repairing floors of culverts and guard rail.

Construction

	<i>Total Expenditure.</i>	<i>Cost for Township.</i>
Earthwork	\$3,224 60	\$ 967 38
Road surface	6,202 11	1,860 63
Bridges and culverts	1,549 40	464 82
Guard rail	25 00	7 50
Side entrance culverts	193 33	58 00
	\$11,194 44	\$3,358 33

Maintenance

	<i>Total Expenditure.</i>	<i>Cost for Township.</i>
Road surface	\$291 50	\$87 45
Bridges and culverts	27 83	8 35
Guard rail	9 15	2 74
	<u>\$328 48</u>	<u>\$98 54</u>
Total cost for township		\$3,456 87

Ontario County

Masonry work was completed at Pickering Bridge and nineteen pedestals and one abutment constructed at the Rouge River Bridge. The total cost of this work was \$28,833.52.

Summary

	<i>Total Expenditure.</i>	<i>Cost to County.</i>
Bridges and culverts	\$28,833 52	\$8,650 06

Summary for Ontario County

	Construction	Maintenance	Total	30% Payable by County
	\$ c.	\$ c.	\$ c.	\$ c.
Pickering, Twp.....	105,745 62	1,462 98	107,208 60	32,162 58
Pickering, Village.....		539 45	539 45	161 83
Whitby, Town.....	1,338 99	725 58	2,064 57	619 37
East Whitby, Twp.....	6,514 87	1,207 56	7,722 43	2,316 73
West Whitby, Twp.....	11,194 44	328 48	11,522 92	3,456 87
Ontario, County.....	28,833 52	.....	28,833 52	8,650 06
	<u>153,627 44</u>	<u>4,264 05</u>	<u>157,891 49</u>	<u>47,367 44</u>
Less amount overpaid by Whitby, W., 1919.....			\$280 33	
“ “ by Whitby Town.....			647 23	
				<u>\$927 56</u>
Total payable by County.....				\$46,439 88

UNITED COUNTIES OF NORTHUMBERLAND AND DURHAM**Town of Brighton**

From the west limits of the town east for thirty-two hundred feet, the road was ditched and graded to a width of 30 feet at a cost of \$249.40.

Two heavy coats of gravel were placed on the above grading at a cost of \$2,140.50.

Five culverts of 15-inch vitrified pipe 20 feet long were installed under side entrances at a cost of \$167.80.

Two-thirds of a mile of independent and hydro poles were moved at a cost of \$170.25.

Maintenance charges cover the cost of patching and dragging one-and-a-half miles of highway. The culvert at the mill, west side of the town was filled in at a cost of \$17.60.

Construction

	<i>Total Expenditure.</i>	<i>Cost for Municipality.</i>
Earthwork	\$249 40	\$74 82
Road surface	2,140 50	642 15
Side entrance culverts	167 80	50 34
Moving poles	170 25	51 07
	<u>\$2,727 95</u>	<u>\$818 38</u>

Maintenance

	<i>Total Expenditure.</i>	<i>Cost for Municipality.</i>
Road surface	\$330 30	\$99 09
Bridges and culverts	17 60	5 28
	<hr/> \$347 90	<hr/> \$104 37.
Total cost for municipality		922 75

Brighton Township

One and two-tenths miles of highway were ditched and graded to a width of 30 feet at a total cost of \$1,850.

Two heavy coats of gravel were placed on the above grading at a cost of \$4,808.65.

Two 18-inch concrete pipes were lengthened and two concrete culverts 4 x 3 x 38 ft. were constructed under the highway at a total cost of \$2,118.50.

Nine culverts of 15-inch vitrified pipe 20 feet long were installed under side entrances and one carload of tile is on hand for next season's work. The total cost was \$569.66.

A quarter of a mile of independent telephone poles were moved at a total cost of \$103.16.

Maintenance charges cover the cost of patching and dragging the entire length of the highway, cutting the shoulders off the road with a grader in several places, keeping culverts and guard rails in repair and cutting weeds.

Construction

	<i>Total Expenditure.</i>	<i>Cost for Municipality.</i>
Earthwork	\$1,850 00	\$555 00
Road surface	4,808 65	1,442 59
Bridges and culverts	2,118 50	635 55
Guard rail	24 40	7 32
Side entrance culverts	569 66	170 90
Moving poles	103 16	30 95
	<hr/> \$9,474 37	<hr/> \$2,842 31

Maintenance

	<i>Total Expenditure.</i>	<i>Cost for Municipality.</i>
Road surface	\$840 65	\$252 19
Bridges and culverts	11 94	3 58
Cutting weeds	8 00	2 40
	<hr/> \$860 59	<hr/> \$258 17
Total cost for municipality		\$3,100 48

Town of Colborne

Three hundred feet of highway was ditched and graded over the new culvert constructed west of the town. The cost of this earthwork was \$51.20.

Two heavy coats of gravel were placed on sixteen hundred feet of road west of the town, and a heavy coat of gravel placed on a quarter of a mile of road east of the town at a total cost of \$1,348.29.

One culvert 5 x 4 ft. 6 in. x 47 ft. 6 in. was constructed at a cost of \$986.22.

A side entrance culvert was lengthened at a cost of \$19.80.

Maintenance charges cover the cost of patching one and one-quarter miles of highway and keeping guard rails and culverts in repair. Eleven barrels of oil are stored for next season's use.

Construction

	<i>Total Expenditure.</i>	<i>Cost for Municipality.</i>
Earthwork	\$51 20	\$15 36
Road surface	1,348 29	404 49
Bridges and culverts	986 22	295 86
Side entrance culverts	19 80	5 94
	<hr/> \$2,405 51	<hr/> \$721 65

Maintenance

	<i>Total Expenditure.</i>	<i>Cost for Municipality.</i>
Road surface	\$595 34	\$178 60
Bridges and culverts	6 00	1 80
Guard rails	2 25	67
	<hr/> \$603 59	<hr/> \$181 07
Total cost for municipality		<hr/> \$902 72

Cramahe Township

Ditching and grading to a width of 20 feet was completed over the following sections of highway; from Haldimand township line east for a quarter of a mile; from Salem west for eight-tenths of a mile; from a quarter of a mile west of Brighton township line west for a mile and a half. The cost of this earthwork was \$4,636.50.

Two and six-tenths miles of highway were given two heavy coats of gravel at a cost of \$8,089.08.

The following concrete culverts were constructed under the highway: One 3 x 3 x 48; one 3 x 3 x 54 box culvert; one 17 x 8 x 50. The total cost of the above culverts was \$5,552.79.

New guard rails were constructed at a cost of \$22.50.

One mile of independent telephone line was moved off the new grading at a cost of \$361.05.

Thirty-seven culverts of 15-inch vitrified pipe were installed under side entrance and four culverts of 15-inch vitrified pipe were installed under side roads. A total length of 912 feet of pipe at a cost of \$1,076.32.

Maintenance charges cover the cost of patching and dragging the entire length of highway, keeping culverts and guard rail in repair and cutting weeds.

Construction

	<i>Total Expenditure.</i>	<i>Cost for Municipality.</i>
Earthwork	\$5,636 50	\$1,690 95
Road surface	8,089 08	2,426 72
Bridges and culverts	5,552 79	1,665 84
Guard rail	22 50	6 75
Moving poles	361 05	108 32
Side entrance culverts	1,076 32	322 89
	<hr/> \$20,738 24	<hr/> \$6,221 47

Maintenance

	<i>Total Expenditure.</i>	<i>Cost for Municipality.</i>
Road surface	\$401 59	\$120 47
Bridges and culverts	10 00	3 00
Guard rail	30 05	9 02
Cutting weeds	74 80	22 44
	<hr/> \$516 44	<hr/> \$154 93
Total cost for municipality		<hr/> \$6,376 40

Haldimand Township

From Grafton west, a distance of nine-tenths of a mile, the highway was ditched and graded to a width of 30 feet. Grades were reduced and road straightened out at Grafton toll-house, which necessitated heavy earthwork. Road was graded from Fairview Cemetery west for one-third of a mile and grade was raised three feet over the new culvert. From Cramahe Township line west for one and seven-tenth miles, road was ditched, bad winds taken out and widened to a width of 30 feet. The total cost of the above earthwork was \$10,911.22.

Two miles of highway were very heavily gravelled at a cost of \$6,729.70.

Five concrete culverts were constructed as follows: One 12 x 6 x 39 two miles west of Colborne; one 5 x 5 x 44 two and one-half miles west of Colborne; one 10 x 6 x 42 half a mile east of Grafton; one 6 x 3 x 41 half a mile east of Grafton; one 12 x 5 x 42 one and one-half miles west of Grafton. The total cost of these culverts was \$8,936.51.

Guard rail was constructed on the new grading at several places at a cost of \$67.50. Eleven hundred feet of independent telephone line was moved at a cost of \$99.42.

Thirty-one culverts were installed under side entrances and side roads, including one 36-inch galvanized iron pipe 20 feet long and one 36-inch galvanized iron pipe 33 feet long. Five hundred and fifty feet of 15-inch tile are on hand for next season's work. Total cost of above was \$954.50.

Maintenance charges cover the cost of patching and dragging the entire road, placing a light coat of oil through Grafton Village, cutting the weeds and repairing and whitewashing guard rails.

Construction

	<i>Total Expenditure.</i>	<i>Cost for Municipality.</i>
Earthwork	\$10,911 22	\$3,273 37
Road surface	6,729 70	2,018 91
Bridges and culverts	8,936 51	2,680 95
Guard rails	67 50	20 25
Moving poles	99 42	29 83
Side entrance culverts	954 50	286 35
	<u>\$27,698 85</u>	<u>\$8,309 66</u>

Maintenance

	<i>Total Expenditure.</i>	<i>Cost for Municipality.</i>
Road surface	\$624 10	\$187 23
Bridges and culverts	46 60	13 98
Guard rails	19 50	5 85
	<u>\$690 20</u>	<u>\$207 06</u>
Total cost for municipality		<u>\$8,516 72</u>

Murray Township

One and three-quarters miles of highway were ditched and graded to a width of 30 feet at a cost of \$2,400.

Two heavy coats of gravel were placed on all the above earthwork at a cost of \$5,019.

Three 18-inch concrete pipe culverts under the highway were extended to allow for the extra widening at a cost of \$200.

Ten culverts of 15-inch vitrified pipe 20 feet long were installed under side entrances at a cost of \$218.28.

One-half a mile of independent telephone line was moved at a cost of \$105.17.

New guard rail was constructed when required at a cost of \$13.

Maintenance charges cover the cost of patching, dragging, cutting the shoulders off the road with a grader, cutting the weeds, and keeping the culverts in repair.

Construction

	<i>Total Expenditure</i>	<i>Cost for Municipality.</i>
Earthwork	\$2,400 00	\$720 00
Road surface	5,019 05	1,505 72
Bridges and culverts	200 00	60 00
Guard rail	13 00	3 90
Side entrance culverts	218 28	65 48
Moving poles	105 17	31 55
	<u>\$7,955 50</u>	<u>\$2,386 65</u>

Maintenance

	<i>Total Expenditure</i>	<i>Cost for Municipality.</i>
Road surface	\$706 60	\$211 98
Bridges and culverts	15 00	4 50
	<hr/>	<hr/>
	\$721 60	\$216 48
Total cost for municipality		<hr/>
		\$2,603 13

Town of Cobourg

At the west limits of the town a sharp turn was cleared and partly graded. The cost of this work was \$48.75.

A light coat of gravel was placed on a half-mile road, at a cost of \$94.

Construction

	<i>Total Expenditure.</i>	<i>Cost for Municipality.</i>
Earthwork	\$48 75	\$14 63

Maintenance

Road surface	\$94 00	\$28 20
Total cost for municipality		<hr/>
		\$42 83

Bowmanville Town

From the east limits of the town west for 2,200 feet, the highway was ditched and widened to 38 feet, extra widening being made to accommodate a new sidewalk and heavy grading carried out. West of the town the road was graded for 600 feet. The total cost of the above earthwork was \$4,525.25.

A heavy coat of gravel and a coat of cinders was placed on the new grading east of the town, and the cinder walk was constructed. The cost of this work was \$698.75.

Construction of concrete abutments, piers, sidewalks and floors, the supply and erection of steel for three bridges in Bowmanville Town, to complete, \$50,927.04.

A quarter of a mile of road was gravelled and the total length of road assumed was patched and kept in repair.

Construction

	<i>Total Expenditure.</i>	<i>Cost for Municipality.</i>
Earthwork	\$4,525 25	
Tile and pipe draining	4 05	
Road surface	698 75	
Guard rail	1 35	
	<hr/>	
	\$5,229 40	\$1,568 82
Bridges and culverts as per attached statement		10,315 02

Maintenance

Road surface	\$620 00	\$186 00
Total cost for municipality (county)		<hr/>
		\$12,069 84

Bowmanville Bridges**STATION 4951-40***Total Expenditure. Cost for Municipality.*

Cost to Jan. 31, 1919.		
Cost from Feb. 1, 1919, to Jan. 31, 1920.....	\$7,177 21	
Total cost to Jan. 31, 1920	1,522 82	\$8,700 03

STATION 4960

Cost to Jan. 31, 1919.		
Cost from Feb. 1, 1919, to Jan. 31, 1920	\$2,992 20	
Total cost to Jan. 31, 1920	4,999 29	7,991 49

STATION 5026

Cost to Jan. 31, 1920.		
Cost from Feb. 1, 1920, to Nov. 30, 1920	\$31,509 06	
Total cost to Nov. 30, 1920	13,900 77	45,409 83
Total cost of three bridges		\$62,101 35
Total due to province in accordance with statement to county....		\$17,019 60
Statement rendered to Bowmanville June 24, 1919		6,704 58
Balance due from county		\$10,315 02

Clarke Township

Between Darlington township line and Newcastle 1.44 miles of highway were ditched and graded to a width of 30 feet. Heavy earthwork was carried out at Wilmot Creek when the grades were raised 5 feet and approaches to the new bridge constructed. Wilmot Creek was diverted on the north side of the bridge to prevent wall on the highway, and trees were cut for better visibility. The road was graded and ditched for half a mile east from the C. P. R. subway and for five hundred feet in Newtonville village. At Thompson's culvert the grade was raised and a quarter of a mile of highway graded and ditched. The creek at this point was diverted and the channel deepened. The total cost of the above work was \$9,495.99.

A heavy coat of gravel was placed on the road from Darlington Township line to Newcastle, from the C. P. R. subway east for half a mile, seven hundred feet at Newtonville village, and from the Hope Township line west for two and six-tenths miles. The total cost of this work was \$4,814.90.

The following culverts and bridges were constructed:

Two 18-inch concrete pipe culverts, 40 feet long.

One steel span bridge with concrete abutments and floor at Wilmot Creek.

One 7 x 6 x 38 feet long a mile west of Newcastle.

One 8 x 8 x 81 feet culvert at Thompson's.

The total cost of these culverts was \$8,486.66.

Brush was cleared to the full width of the highway in the swamp, three miles east of Newcastle.

Three side entrance culverts of 18-inch vitrified pipe, 20 feet long; five side entrance culverts of 15-inch pipe, 20 feet long, and two culverts across side roads of 18-inch vitrified pipe, 33 feet long, were installed, at a total cost of \$126.20.

Maintenance charges cover light gravelling, patching and dragging the entire road, oiling Newtonville village and keeping the culverts in repair.

Construction*Total Expenditure. Cost for Municipality.*

Earthwork	\$9,495 99	\$2,848 80
Road surface	4,814 90	1,444 47
Bridges and culverts	8,486 66	2,546 00
Moving poles	126 20	37 86
Brushing	92 00	27 60
Side entrance culverts	616 87	185 06
	<u>\$23,632 62</u>	<u>\$7,089 79</u>

Maintenance

Road surface	\$905 31	\$271 59
Bridges and culverts	13 50	4 05
	<u>\$918 81</u>	<u>\$275 64</u>
Total cost for municipality		\$7,365 43

Darlington Township

All ditching and grading was completed between Bowmanville and Clarke Township line and twelve hundred feet of the highway situated about two miles west of Bowmanville was ditched. The total cost of above earthwork was \$2,121.70.

Two heavy coats of gravel were placed on seven and eight-tenths miles of the highway, at a cost of \$8,024.73.

A few independent telephone poles were removed from the new grading at a cost of \$21.

Thirteen culverts of 15-inch vitrified pipe were installed under side entrances and side roads, a total length of 360 feet of pipe, at a cost of \$254.63.

Maintenance charges cover the cost of oiling at Courtice and Tooley's Hill, patching and dragging over 7.8 miles of road, keeping culverts in repair and cutting weeds.*

Construction

	<i>Total Expenditure.</i>	<i>Cost for Municipality.</i>
Earthwork	\$2,121 70	\$636 51
Road surface	8,231 43	2,469 43
Guard rail	32 00	9 60
Side entrance culverts	254 63	76 39
Moving poles	21 00	6 30
	<u>\$10,660 76</u>	<u>\$3,198 23</u>

Maintenance

Road surface	\$1,035 85	\$310 75
Bridges and culverts	13 00	3 90
Cutting weeds	12 00	3 60
	<u>\$1,060 85</u>	<u>318 25</u>
Total cost for municipality		\$3,516 48

Hope Township

Very heavy earthwork was undertaken and partly completed at Roseberry Hill. This work is half a mile long, and reduces the grade from 7% to 5%, and widens the road to standard width. Heavy earthwork was completed, reducing the grade and widening the road from Marvin's farm west for one mile. Four hundred feet of grading was finished one and one-half miles west of Welcome. Welcome corner was cleared and eight-tenths of a mile of highway graded and ditched between Welcome and Port Hope. From Hamilton Township line west for 3,700 feet the highway was ditched and graded to a width of 30 feet. The total cost of this earthwork was \$12,609.24.

Two heavy coats of gravel were placed on the above grading at a cost of \$7,093.70.

The following concrete culverts were constructed under the highway:

- Two culverts, 3 x 3 x 33.
- One culvert, 4 x 3 x 33.
- One culvert, 4 x 3 x 38.
- One culvert, 6 x 3 x 33.
- One culvert, 6 x 4 x 44.
- One culvert, 11 x 6 x 42.

Two culverts started before January 31, 1918, were completed. The total cost of the above culvert work was \$9,235.35.

Seven side-entrance culverts of 18-inch vitrified pipe, 20 feet long; one side-entrance culvert of 24-inch concrete pipe, 26 feet long, and one culvert across a sideroad 18-inch vitrified pipe, 33 feet long, were installed. Sixty feet of 18-inch concrete pipe were installed at Helm's Corner. One carload of 15-inch vitrified pipe is on hand for next year's work. The total cost was \$712.29.

One mile of independent and G. N. W. telephonic lines was moved at a cost of \$512.78. Maintenance charges cover the cost of patching and dragging the entire length of highway, cutting weeds, repairing culverts and oiling from Welcome to Port Hope.

Construction

	<i>Total Expenditure.</i>	<i>Cost for Municipality.</i>
Earthwork	\$12,609 24	\$3,782 78
Road surface	7,093 70	2,128 11
Bridges and culverts	9,235 35	2,770 60
Guard rail	4 50	1 35
Moving poles	512 78	153 83
Side entrance culverts	712 29	213 69
	<hr/> \$20,167 86	<hr/> \$9,050 36

Maintenance

	<i>Total Expenditure.</i>	<i>Cost for Municipality.</i>
Road surface	\$1,008 29	\$302 48
Bridges and culverts	14 06	4 22
Cutting weeds	4 20	1 26
	<hr/> \$1,026 55	<hr/> \$307 96
Total cost for municipality		\$9,358 32

Newcastle Village

From the west limits of the village east for a quarter of a mile the highway was ditched and graded to a width of 30 feet at a cost of \$601.45.

A heavy coat of gravel was placed on half a mile of road at a cost of \$542.85.

A man-hole was constructed at a cost of \$28.

Maintenance charges cover the cost of patching, dragging, weed cutting and repairs to guard rails and culverts.

Construction

	<i>Total Expenditure.</i>	<i>Cost for Municipality.</i>
Earthwork	\$604 95	\$181 48
Road surface	642 85	192 85
Guard rail	7 10	2 13
Bridges and culverts	28 00	8 40
	<hr/> \$1,282 90	<hr/> \$384 86

Maintenance

Road surface	\$257 75	\$77 33
Total cost for municipality		\$462 19

Town of Port Hope

The corner at Walton Street and Toronto Road was cleared, and hedge and trees cut down. This work cost \$18.50.

Half a mile of highway was heavily gravelled at a cost of \$547.70.

A light coat of gravel was placed on the road from King Street East, a distance of 1,000 feet and a light coat of oil placed on half a mile of the highway. A culvert was repaired at the west end of the town at a cost of \$12.

Construction

	<i>Total Expenditure.</i>	<i>Cost for Town.</i>
Earthwork	\$18 50	\$5 55
Road surface	547 70	164 31
	<hr/> \$566 20	<hr/> \$169 86

Maintenance

Road surface	\$383 77	\$115 13
Bridges and culverts	12 00	3 60
	<hr/> \$395 77	<hr/> \$118 73

Total cost for town \$288 59

Hamilton Township

Two and one-half miles of highway were ditched and graded to a width of 30 feet. At Massey's Bridge heavy earthwork was required to widen the road and raise the grade three feet. The total cost of this work was \$3,656.15.

A heavy coat of gravel was placed on the above earthwork after grading was completed, at a cost of \$4,529.81.

One steel bridge, 26-feet span, with concrete abutments, was completed at Massey's Creek, and the concrete work complete and steel in place for a 45-feet span steel bridge at Gage's Creek. The cost of these bridges was \$11,481.46.

Eleven culverts of 15-inch vitrified pipe, 20 feet long; two culverts 36-inch galvanized iron pipe, 20 feet long, and one 24-inch galvanized iron pipe, 30 feet long, were placed under side entrances at a cost of \$688.05.

New guard rails were constructed at a cost of \$18.

Maintenance charges cover the cost of cutting off the shoulders of the road in several places, dragging the entire road, cutting weeds and repairing decking on Massey's Bridge. Danger-crossing signs were placed at C. P. R. and C. N. R. crossings. Three toll-gates and houses were removed and their foundations levelled.

Construction

	<i>Total Expenditure.</i>	<i>Cost for Municipality.</i>
Earthwork	\$3,656 15	\$1,096 85
Road surface	4,529 81	1,358 94
Bridges and culverts	11,481 46	3,444 43
Side-entrance culverts	688 05	206 42
Guard rail	18 00	5 40
	<hr/> \$20,373 47	<hr/> \$6,112 04

Maintenance

Road surface	\$226 81	\$68 04
Bridges and culverts	66 74	20 02
Cutting weeds	42 00	12 60
	<hr/>	<hr/> \$100 66

Total cost for municipality \$6,212 70

Summary for Northumberland and Durham Counties

—	Construction	Maintenance	Total	Payable by County
	\$ c.	\$ c.	\$ c.	\$ c.
Brighton, Town	2,727 95	347 90	3,075 85	922 75
Brighton, Twp	9,474 37	860 59	10,334 96	5,100 48
Colborne, Town	2,405 51	603 59	3,009 10	902 72
Cramahe, Twp	20,738 24	516 44	21,254 68	6,376 40
Haldimand, Twp	27,698 85	690 20	28,389 05	8,516 72
Murray, Twp	7,955 50	721 60	8,677 10	2,603 13
Cobourg, Town	48 75	94 00	142 75	42 83
Bowmanville, Town	5,229 40	620 00	5,849 40	1,754 82
Bowmanville, Bridges	50,924 04	.....	50,924 04	10,315 02
Clarke Twp	23,632 62	918 81	24,551 43	7,365 43
Darlington, Twp	10,660 76	1,060 85	11,721 61	3,516 48
Hope, Twp	30,167 86	1,026 55	31,194 41	9,358 32
Newcastle, Village	1,282 90	257 75	1,540 65	462 19
Port Hope, Town	566 20	395 77	961 97	288 59
Hamilton, Twp	20,373 47	335 55	20,709 02	6,212 70
	213,889 42	8,449 60	222,339 02	61,738 58

HASTINGS COUNTY

Sidney Township

The thickly-settled section between the Town of Trenton and the City of Belleville has necessarily caused the new road to follow very closely the old alignment. Advantage has been taken, however, of every situation that allowed the centre line to be shifted so as to flatten or obliterate the curve.

During the season an attempt was made to drain the highway across the entire township. Due to scarcity of labour, however, it was found that it was possible to bring only short lengths of road to the proper cross-section. Over the remaining sections the grader with tractor was used. The ditches were then cleaned, brush and rubbish cut out and removed, and drainage opened up. The following stations indicate the lengths of road graded to required cross-section:

Station 1300-57	to	1304-38
" 1351-61	"	1355-00
" 1417-77	"	1423-04
" 1527-00	"	1532-00
" 1541-90	"	1573-00

Stations 1640-00 to 1730-79—This section, was ditched. The cross-section is such that road is ready for surface construction. In all, approximately one mile of road was graded to cross-section.

In view of the close relationship between ditching, placing farm entrance tile and light earthwork, some difficulty was experienced in securing unit costs. A total of 562 feet of farm entrance pipe was laid, and one road intersection culvert of 40 feet in length. The total cost of the above work was \$1,747.33.

Culverts were constructed, one of each of the following sizes: 3 x 3 x 33, 16 x 5 x 36 ft. 3 ins., 6 x 5 x 33, 4 x 5 x 33, 5 x 5 x 33, and 12 x 5 x 33; also 11 15-inch concrete pipes reinforced with 6-inch concrete and masonry end walls. The total cost of this work was \$12,466.27.

The road was gravelled throughout the township. Stations 1248 to 1739-80, to an average depth of 5 inches and a width of approximately 18 feet. Log drags were used to maintain and help consolidate this material. The total cost for placing gravel and consolidating same was \$17,282.19. Approximately 8,470 cubic yards of gravel was used, making an average cost of \$2.40 per cubic yard. This section of road was considered in excellent shape at the end of 1919 season.

Construction

	<i>Total Expenditure.</i>	<i>Cost for Township</i>
Earthwork and side-entrance culverts	\$1,747 33	\$524 20
Tile and pipe draining	14 40	4 32
Road surface	17,282 19	5,184 66
Bridges and culverts	12,466 27	3,739 88
Guard rail	162 50	48 75
	<hr/> \$31,672 69	<hr/> \$9,501 81

Tyendinaga Township

Very little change of alignment is anticipated through this township, the only deviations necessary being in the Village of Shannonville, where the road crosses the Salmon River direct, and at Marysville, where the road turns south to Deseronto, passing behind the buildings at this point.

Temporary drainage was undertaken where it was impossible to attempt to bring the road to the proper cross-section. All culverts were also cleaned and repaired.

The following lengths of road were graded to proper cross-section: Stations 99-77 to 136-66, Stations 403-25 to 493-50, Stations 766-87 to 791-06, making a total of 3 miles at a cost of \$9,910.98. This also includes the laying of 180 feet of farm entrance tile. A heavy cut through hill half mile south of Marysville accounts for large percentage of this amount.

The following culverts were built: One, 6 x 4 x 38; two, 3 x 3 x 36; and 15-inch concrete reinforced tile with concrete end walls, at a total cost of \$2,998.73.

The road surface through this township was also in an extremely bad condition. Repairs were made as follows:

Stations 97-77 to 137-50—Four-inch limestone was used. This was spread to a width of 18 feet and consolidated to 6 inches in depth by rolling. Pit gravel was used as a filler.

Stations 403-20 to 682-35—Pit gravel was used. This was spread to an average width of 12 feet and 5 inches in thickness, the whole being consolidated by log drag.

Stations 682-35 to 780-00—Two-inch stone was spread to a width of 15 feet and 6 inches in depth, and covered with limestone screenings. This same method of repairing was used from Stations 780-00 to 824-58, except that the width of metal would not average over 12 feet. Approximately 11,740 cubic yards of material was placed on the road at a cost of \$23,368.39. Metalling was completed, as shown above, across the township, approximately 9 miles.

Construction

	<i>Total Expenditure.</i>	<i>Cost for Township.</i>
Earthwork and entrance culverts	\$9,910 98	\$2,973 29
Bridges and culverts	2,998 73	899 62
Road surface	23,368 39	7,010 52
	<hr/> \$36,278 10	<hr/> \$10,883 43
Total cost for township		\$10,883 43

Indian Reserve

The alignment through the Reserve follows very closely the old road. No deviation from this at present has been assumed.

No attempt was made to maintain the present ditches. Some grading was undertaken, however, and the road finished to the proper cross-section from Station 65-00 to 97-77. Sucker Creek Hill, Station 30-00, was also lowered, 3,100 cubic yards being taken from same, but the work was not finished to grade. The total cost of earthwork was \$4,071.08.

One of each of the following sized culverts was constructed: 4 x 3 x 40, 6 x 2 ft. 6 in. x 38, 3 x 3 x 50, 3 x 3 x 33, 4 x 3 x 36.

No attempt was made to gravel the section from Deseronto West to Marysville side-road. From this point, however, beginning at Station 0-00 to Station 35-00, 2-inch stone, dressed with screenings, was used. From this point to Station 65-00 the road was given a light coat of pit gravel, these sections averaging 10 feet in width and 5 inches in thickness. From Station 65-00 to 97-75 4-inch stone was used, being spread to 18 feet in width and consolidated with roller to 6 inches in depth. Pit gravel was then used as a binder. Approximately two miles were metalled, 3,552 cubic feet of material being used at a total cost of \$7,359.27.

Construction

	<i>Total Expenditure.</i>	<i>Cost for Reserve.</i>
Earthwork and entrance culverts	\$3,457 08	\$1,037 12
Bridges and culverts	3,579 43	1,073 83
Road surface	7,359 27	2,207 78
	<u>\$14,395 78</u>	<u>\$4,318 73</u>

Thurlow Township

Through this township some change in alignment has been found necessary. The land, generally of a shallow nature, lends itself quite readily to any deviations required, very little tillable land being interfered with. Deviations are short, however, the new centre line following the old grade fairly closely.

On account of lateness of season and scarcity of men, very little grading was undertaken, only 1,200 feet of road being brought to the proper cross-section. The ditches were cleared and all culverts were cleaned and rebuilt. The total cost for this work, including the laying of 120 feet of entrance culvert, was \$436.80.

The following culverts were constructed: Two 3 x 3 x 36; three 3 x 2 x 33, and one 4 x 3 x 36. The cost of this work was \$4,478.58.

Work was commenced in this township July 21st, and on account of the extremely bad condition of the road it was thought advisable to put the surface in passable condition at once. Crushed stone and gravel were used in all, approximately 7,000 cubic yards of material, at a total cost of \$16,862.24. The stone was spread to a width of 12 feet and an average depth of 6 inches, a layer of screenings placed over the surface, and the whole consolidated by the use of a split log drag. Metalling was completed, as shown above, across the township, approximately 6 miles.

Construction

	<i>Total Expenditure.</i>	<i>Cost for Township.</i>
Bridges and culverts	\$4,478 58	\$1,343 58
Earthwork and farm entrance culverts	436 80	131 04
Road surface	16,862 24	5,058 67
	<u>\$21,777 62</u>	<u>\$6,533 29</u>

Summary for Hastings County

	Construction	Maintenance	Total	30% Payable by County
	\$ c.	\$ c.	\$ c.	\$ c.
Sidney, Twp.	31,672 69	.....	31,672 69	9,501 81
Tyendinaga, Twp.	36,278 10	.....	36,278 10	10,883 43
Indian Reserve.	14,395 78	.....	14,395 78	4,318 75
Thurlow, Twp.	21,777 62	.....	31,777 62	6,533 29
	<u>104,124 19</u>	<u>.....</u>	<u>102,124 19</u>	<u>31,237 28</u>

LENNOX AND ADDINGTON

Ernesttown Township

Work was started in this township early in May. Grading commenced in the west boundary; Station 273-50 completed to Station 363-27. From this point to east boundary of township, Station 866-30, the cross-section is such that construction may be proceeded with at once.

Farm entrance and road intersection culverts were placed over the section graded, in all 440 feet being laid. The cost of earthwork and side-entrance culverts was \$2,133.83.

A new steel bridge, span 45 feet, and two culverts, 6 x 4 x 36 and 5 x 5 x 43, were constructed at a cost of \$9,758.83.

From Station 273-50 to 417-27 road was patched with broken limestone and consolidated with roller. Stations 417-10 to 542-13—the road was given a light surfacing with pit gravel. Stations 564-80 to 743-00—a rubble stone was used. This was spread to 18 feet in width, consolidated with roller, with pit gravel and sand as binder. It was intended that this course should act as base for future construction. On a short section near Village of Odessa screenings were used instead of sand as binder. Approximately 8 miles were metalled, 7,986 cubic yards of material being used at a cost of \$17,426.25.

Construction

	<i>Total Expenditure.</i>	<i>Cost for Township.</i>
Earthwork and side-entrance culverts	\$2,133 83	\$640 15
Bridges and culverts	9,758 96	2,927 68
Road surface	17,426 25	5,227 88
	<hr/> \$29,319 04	<hr/> \$8,795 71

North Fredericksburg Township

No change in alignment was considered in this township, the new road following the centre line of old location.

Light grading, such as ditch maintenance, had been undertaken during the Fall of 1918. This was continued in the Spring of 1919, and completed to cross-section in August. The cost of this earthwork, including the laying of 760 feet of entrance and road intersection culverts, was \$2,950.68.

The following culverts were constructed: Two 18-inch concrete pipe, reinforced with 6-inch concrete and concrete masonry end walls; one 5 x 4 x 36, and one 16 x 4 feet 5 inches x 36, at a cost of \$4,080.50.

Construction of macadam road was undertaken in this township and completed from Station 93-00 to 251-00. A rubble base 20 feet wide and 8 inches deep was consolidated, and on this a layer of 2-inch stone consolidated to 4 inches in depth, with limestone screenings as binder. The cost of this construction work was \$36,503.37, or approximately \$12,167.79 per mile, with 14,860 cubic yards of material used. These costs, as shown above, include placing crushed stone over all entrance culverts and building a short section across the highway at all cross-roads.

Construction

	<i>Total Expenditure.</i>	<i>Cost for Township.</i>
Earthwork and side-entrance culverts	\$2,950 68	\$885 20
Bridges and culverts	4,080 58	1,224 18
Road surface	36,503 37	10,951 01
Rockwork	118 50	35 55
	<hr/> \$43,653 13	<hr/> \$13,095 94

Napanee Hill

The rockwork at Napanee Hill was undertaken late in the Fall. The object of grade reduction at this point was partly to secure material for macadam construction and also to reduce a heavy grade.

The following amount was expended before the end of January:—

Construction

	<i>Cost in Township.</i>
\$2,070 00	\$621 00
Total cost for township	<hr/> \$13,716 94

Richmond Township

The road allowance through this township when assumed had an average width of 40 feet. Before ditching or grading could be undertaken it was necessary to purchase additional land so that the road might be straightened and widened. This was done for 2½ miles directly west of Napanee, the remaining 3½ miles of road not being widened. Generally the new centre line follows closely the old alignment.

Grading commenced in this township about July 21st. From Station 58-60 to 120-30 the road was brought to the proper cross-section. Due to numerous small hills in this section the grading was comparatively heavy. This earthwork, including the placing of 275 feet of farm-entrance culverts, was done at a cost of \$4,258.62.

Culverts were constructed as follows: 2 24-inch tile, 40 feet long, reinforced with 9-inch concrete and concrete head walls, 5 x 4 x 44, 3 x 2 x 38, 3 x 2 x 36, 3 x 2 x 33, and the cost was \$3,538.70.

Construction and repairs were undertaken as follows:

Stations 63-00 to 120-00—Road macadamized. This work was completed in two courses, 8-inch rubble base, 20 feet wide, and 4 inches of 2-inch stone, and stone screenings being used as a binder.

Stations 120-00 and 188-00—Only light patchwork was undertaken, bad holes and ruts being filled.

Stations 188-00 to 302-50—Road received a heavy coat of 2-inch stone, spread loosely on the road, an average width of 12 feet and 6 inches deep. This was covered with stone screenings and consolidated with log drag. Approximately 5 miles of road was metalled, 7,770 cubic yards of material being used at a cost of \$25,468.74.

Construction

	<i>Total Expenditure.</i>	<i>Cost for Township.</i>
Earthwork and side-entrance culverts	\$4,258 62	\$1,277 58
Bridges and culverts	3,538 70	1,061 61
Road surface	25,468 74	7,640 62
Guard rail	3 17	96
	<u>\$33,269 23</u>	<u>\$9,980 77</u>

Summary for United Counties

	Construction	Maintenance	Total	30% Payable by County
	\$ c.	\$ c.	\$ cs	\$ c.
Ernesttown, Twp.....	29,319 04	.....	23,319 04	8,795 71
North Fredericksburg, Twp.....	45,723 13	.....	45,723 13	13,716 94
Richmond, Twp.....	33,269 23	.....	33,269 23	9,980 77
	<u>108,311 40</u>	<u>.....</u>	<u>108,311 40</u>	<u>32,493 42</u>

FRONTENAC COUNTY

Pittsburg Township

The surface of the road when taken over was in a very rough condition, badly drained, and of varying widths. From the Leeds Township line west, a distance of 35,700 feet, the curves were very sharp, and had to be eased. The road was very hilly and rough, it being close to the River St. Lawrence. From Grass Creek west, a distance of 11,300 feet, the road was almost impassable, making it necessary to ditch, widen and reduce grades. Just east of Kingston, through Barriefield Camp, for a distance of 7,800 feet, the alignment was fairly straight with the exception of one place, where the old road ran around a rock ledge. This was straightened by cutting out the rock. The curve at Barriefield Village was eased.

There were 4,900 feet of fence moved back to regulation width. We have considerable fence still down, but were unable to build same owing to the lateness of the season. As soon as the frost is out it will be erected in the proper location.

From Leeds Township line west for a distance of 35,700 feet we graded, ditched and reduced the grades. Owing to the lack of labour and plant, we were unable to

build the necessary culverts, so replaced 14 old culverts under the road with 18-inch vitrified tile. We placed 37 side-entrance culverts with 15-inch vitrified tile. West of Grass Creek there were two grades reduced from 7 and 8 per cent. to 5 per cent. Ten vitrified tile were placed under the road to replace old culverts which were blocked, and ten side culverts. The material moved was mostly earth. At Barriefield the road was ditched and widened to the regulation width of 30 feet through limestone. Crushed stone was placed on the above to a depth of 4 inches and 18 feet wide for a distance of 7,800 feet.

From Mr. Maxwell's to the top of Barclay's Hill the road was stoned 20 feet wide with stone quarried and crushed from Mr. Barclay's. From Barclay's west for 1½ miles the road was stoned 9 feet wide from MacFadden's Quarry. The haul was over two miles, but, from general appearance, it is better wearing stone than that placed on the east end.

We reduced a number of grades. The most important changes were raising the fill in front of Mr. Brash's from two to three feet, widening the road from fifteen to thirty feet. This fill was made by cutting down the hills east and west; the hill west, known as Barclay's Hill, had an 8 per cent. grade, which was reduced to 4.5 per cent. This hill was rock, and required a cut of 3 feet, with a vertical curve at its summit. At Barriefield there were four rock knolls cut through to reduce the grades and improve the vision.

The road west of the Half-way House was covered with weeds and brush; this was cut and the shoulders graded. The road at Long Grass Creek was deeply rutted, and after every rain the men had to dig across to let off the water. The bridge at Long Grass Creek was replanked. The bridge over Grass Creek was quite dangerous, the east abutment having settled over two feet. We raised the bridge by placing elm logs on the abutment, and replanked it. Twenty-one hundred feet of bituminous road west of Kingston was patched and resurfaced. Eight thousand feet was patched with gravel at the Half-way House.

Maintenance

	<i>Total Expenditure.</i>	<i>Cost for Township.</i>
Road surface, bituminous patching, half mile	\$363 00	\$108 90
“ Patching with gravel	426 30	127 89
Cutting off shoulders and dragging.....	1,093 59	328 08
Bridges and culverts	575 71	172 71
	<u>\$2,458 60</u>	<u>\$737 58</u>

Construction

Grading, earth and rock, 5 miles	\$14,484 26	4,345 28
Road surface, crushing, 2.5 miles, quarrying, hauling, spreading	21,128 56	6,338 57
Guard rail	4 00	1 20
Moving plant	69 80	20 94
Side entrance culverts, No. 47 15-inch vit. pipe		
Pipe culvert under highway, No. 24, 18-inch	1,621 23	486 37
	<u>\$37,307 85</u>	<u>\$11,192 36</u>
Total cost for township		\$11,929 94

Kingston Township

Grading work was generally undertaken in short sections and was principally rock work. It consisted chiefly of opening ditches through rock, ledges, cuts, etc. The cost of this work was \$1,629.60. Earthwork was also light and scattered; the cost of this, including the placing of 580 feet of entrance and road intersection culverts, was \$829.35.

Only patchwork was undertaken through this township. This work was handled by contract. An attempt was made to fill up bad holes, ruts, etc., preparatory to construction in 1920. Approximately 2,500 cu. yds. of broken stone was used across the entire township for this work, which cost \$5,950.43.

Construction

	<i>Total Expenditure.</i>	<i>Cost for Township.</i>
Earthwork and side entrance culverts	\$829 35	\$248 80
Road surface	5,950 43	1,785 13
Moving poles	62 47	18 74
Permanent light	45 33	13 66
Rockwork	1,629 60	488 88
Guard rail	90	27
Totals	\$8,518 08	\$2,555 42
Total cost to township		\$2,555 42

Summary for Frontenac County

	Construction	Maintenance	Total	30% payable by County
	\$ c.	\$ c.	\$ c.	\$ c.
Kingston, Twp.....	8,518 08	.....	8,518 08	2,555 42
Pittsburg, Twp.....	37,307 85	2,458 60	39,766 45	11,929 94
	45,825 93	2,458 60	48 284 53	14,485 36

CARLETON COUNTY**Marlborough Township**

Two parties were working in this township during part of the season moving fences, clearing brush from the right of way, putting up a grade 30 feet wide to the top, with varying depths, and constructing entrances into farms. On this section 6,190 feet of grade has been completed and 1,400 feet half completed. Stone fills, in old ditches have been made for a new foundation, for a distance of 600 feet across some soft areas.

The cost of this work was as follows:

Construction

	<i>Total Expenditure.</i>	<i>Cost for Township.</i>
Earth work	\$2,668 31	\$800 49
Road surface	44 75	13 42
Side entrance culverts	417 95	125 39
Total	\$3,131 01	\$939 30

Nepean Township

During the season two parties were at work in this township, removing old fences, clearing right of way of brush, stumps, rock and similar materials, cutting down hills, making fills, constructing new grades and putting in pipe culverts for farm entrances. Grades were built with top surface of 30 feet as follows: 14,200 feet completed; 1,900 feet half completed; 800 feet about one-third completed. About 7,500 feet of this new grade has been surfaced with a heavy coat of gravel 20 feet wide. Stone fills across soft areas for a distance of 1,500 feet were constructed. In the vicinity of Ottawa the right of way for extra widening has not been acquired and conditions would permit of making the grade of top width of 24 feet, which was completed for a distance of 9,700 feet. A third party of men with a road roller, sprinkler and other necessary tools, and were employed in the vicinity of Ottawa from about July 1st to end of the season, putting down water-bound macadam, 20 feet in width, the crushed stone for same being supplied on the ground by the contractor. This party completed 8,250 feet of this road, laid first course of stone for a distance of 1,450 feet, and repaired the roadbed of the old toll road for a distance of 3,400 feet.

Side entrance cost includes cost of several hundred feet of pipe on the ground but not in place.

In addition to this work during the season Contractor Allen built four reinforced concrete culverts: 5 x 5 x 60; 4 x 4 x 33; 4 x 6 x 36; 7 x 4 x 55.

All charges included in the following totals for work done in the township of Nepean cover only paysheets for men and teams and accounts for material used in construction of the road for the period stated.

Construction

	<i>Total Expenditure.</i>	<i>Cost for Township.</i>
Culverts	\$4,455 77	\$1,336 73
Earthwork	14,430 45	4,329 13
Road surface	31,441 84	9,432 55
Side entrance	1,243 12	372 97
Total	\$51,571 18	\$15,471 35

North Gower

During the season three parties were at work in this township removing old fences, clearing new right-of-way of brush, stumps, rock and similar materials, cutting down hills, making fills and building new grades with the top width of 30 feet. Of these grades 34,300 feet were completed, 7,100 feet half completed, and 4,450 feet one-third completed. Of the completed grades 10,000 feet have been surfaced with a heavy coat of gravel 20 feet wide, 4,900 feet of rubble bottom have been laid, and for a distance of 11,280 feet old ditches in soft areas have been filled with a base of rock. Many side entrances to farms were built, and the total cost of this work was as follows:

All charges included in the following totals for work done in the township of North Gower cover only pay sheets for men and teams and accounts for material used in construction of the road for the period stated.

Construction

	<i>Total Expenditure</i>	<i>Cost for Township.</i>
Earthwork	\$28,856 27	\$8,656 88
Road surface	4,460 05	1,338 01
Road foundation materials	1,630 00	489 00
Side entrance culverts	456 55	136 97
Total	\$35,402 87	\$10,620 86

Summary for Carleton County

	Construction	Maintenance	Total	30% Payable by County
	\$ c.	\$ c.	\$ c.	\$ c.
North Gower Twp.....	35,402 87	.....	35,402 87	10,620 86
Nepean Twp.....	51,571 18	.....	51,571 18	15,471 35
Marlborough Twp.....	3,131 01	.....	3,131 01	939 30
	90,105 06	.....	90,105 06	27,031 51

LEEDS AND GRENVILLE

Escott Township

This road was in a very bad condition, owing to its crooked alignment, trees and shrubbery overhanging the road, bad drainage, and heavy grades. This necessitated re-running and locating a new centre line for the road, clearing, ditching, building culverts, and reducing the grades. A large portion of this grading was through granite rock, which required drilling and dynamite, making progress very slow. Labour was scarce.

Between Lansdowne Township line and the village of Escott, a distance of 10,600 feet, the road was straightened, so that as much of the old road as possible could be used. In this distance the number of curves was reduced to five, whereas formerly there were from 10 to 15. There was considerable fencing done, and two miles of telephone poles, owned by the Lansdowne Rural Telephone Co., moved to their proper location. Four grades were reduced, the heaviest being half a mile west of the village of Escott; this necessitated a side hill cut off from 4 to 10 feet. The material from the cut was not used in the fill, but was crushed and spread over the graded road. The fill was 200 feet long and 8 feet deep over a swamp; the material was procured from a clay hill east of the fill. Moulton's Creek was diverted through solid rock, thus giving the water an outlet, whereas before it had always remained along the road. At this point we had to build a fill 6 feet deep and 150 feet long. It was rip-rapped with stone on the stream side, to save it from the ice in the spring. There was an 8 x 7 concrete culvert built to replace an old concrete arch. This was built late in the fall, as we could not get a concrete mixer earlier. In the fall half a mile west of Escott a 36-inch corrugated pipe was laid on a 6-inch concrete base, and a casing of concrete placed around the barrel. This was mixed by hand. Owing to the scarcity of labour and machinery we were unable to build culverts so placed—6 18-inch vitrified pipes under the highway and 16 15-inch vitrified in side entrances.

The road was surfaced with crushed stone to a width of 9 feet and 6 inches deep. The stone was procured through the township allowing me to use Mr. MacRow's crushing plant for a limited time, as there was no other crusher available.

From the village of Escott east to Yonge Township line the shoulders were graded, ditches opened, and a thin coat of gravel put on and dragged. One bridge at Escott was replanked.

Construction

	<i>Total Expenditure.</i>	<i>Cost for Township.</i>
Grading, earth and rockwork, 2 miles	\$9,213 60	\$2,764 08
Surfacing, crushing, hauling, spreading, 2 miles	4,032 97	1,209 89
Concrete culvert under highway	1,731 71	519 51
Corrugated pipe under highway, 48-inch	225 60	67 68
Side entrance culvert 15 15-inch vit. pipe	277 40	83 28
	<hr/> \$15,481 28	<hr/> \$4,644 38

Maintenance

Surfacing—shoulders graded, road patching, gravelling 4 miles	\$2,900 26	\$870 08
One bridge replanked	43 36	13 01
	<hr/> \$2,943 62	<hr/> \$883 09
Total cost	\$18,424 90	
Total cost for township		\$5,527 47

Yonge Township

This township has fairly good roads, with the exception of the stretch running from Yonge Mills east to the Elizabethtown township line, which has not been finally located and approved of by the Department. However, we ditched, patched the worst places, and dragged the above stretch. A distance of 3,000 feet through the village of Mallorytown was ditched, and patched with crushed stone from Point Anne. Six pipe culverts were installed at farm entrances.

Construction

	<i>Total Expenditure.</i>	<i>Cost for Township.</i>
Half-mile graded	\$672 00	\$201 60
Half-mile stoned	551 19	165 37
	<hr/> \$1,223 19	<hr/> \$366 97

Maintenance

Repairs to culverts	\$66 85	\$20 05
Shoulders cut with grader and road patched	554 80	166 44
	<hr/> \$621 65	<hr/> \$186 49
Total cost	\$1,844 84	
Total cost for township		\$553 46

Lansdowne Township

This road was in a fair condition. Shoulders were graded, ditches cleaned, culverts repaired, and the road gravelled for a distance of 15,300 feet east of the Leeds Township line. Between the two roads leading to Lansdowne, a distance of 9,200 feet, the undergrowth and weeds (which were very thick and obscured the vision to traffic) were cut and the road patched.

Owing to the lack of plant and labour, construction through this township was impossible. However, we gravelled two miles late in the fall.

Construction

	<i>Total Expenditure.</i>	<i>Cost for Township.</i>
Road surfacing—two miles gravelled	\$658 85	\$197 66
Side entrance culverts—pipes under road..	389 32	116 79
Moving telephone poles	42 00	12 60
	<hr/> \$1,090 17	<hr/> \$327 05

Maintenance

Road surface—4 miles, shoulders graded, ditches and culverts cleared	\$2,677 04	\$803 11
Three stone culverts repaired	37 50	11 25
Two miles brushed and road patched	309 50	92 85
	<hr/> \$3,024 04	<hr/> \$907 21
Total cost	\$4,114 21	
Total cost for township		\$1,234 26

Leeds Township

This portion of the highway was in fair condition, so did very little permanent work.

Graded, ditched, straightened alignment, and reduced grades for 2,000 feet three miles west of Gananoque. The progress here was very slow, owing to the hardness of the rock, it being granite and very hard to handle.

From Gananoque west for a distance of 9,500 feet shoulders were graded, a light coat of gravel placed over the same and dragged. From Gananoque east for a distance of 13,600 feet shoulders were graded, surface patched with stone, and rolled. Seventeen pipe culverts were installed at farm entrances, and seven across the road. It was necessary to put in these new pipes, as the old ones were broken and blocked.

Construction

	<i>Total Expenditure.</i>	<i>Cost for Township.</i>
Half-mile graded, ditched	\$1,321 80	\$396 54
Road surface— $\frac{1}{2}$ mile gravelled, dragged....	84 00	25 20
Pipe culverts under highway—4 18-inch vitrified	220 80	66 24
	<hr/> \$1,626 00	<hr/> \$487 98

Maintenance

Road surface—5 miles, shoulder graded, ditched and gravelled	\$4,834 08	\$1,450 23
Pipe culverts under highway, 3 18-inch vitrified .....	.....	.....
Side entrance culverts, 11 15-inch vitrified....	199 85	59 96
	<hr/> \$5,033 93	<hr/> \$1,510 19
Total cost for township		\$1,998 17

Elizabethtown Township

The surface of this road when taken over was in a very rough condition, badly drained, and varying in width, hilly and very poor alignment. From Yonge Township East to Powell's Hill it was a sand road. From Powell's for two miles west we re-located the road, as it was very crooked—in fact, some of the turns were quite

dangerous. On this two miles we graded 5,800 feet. This was sand and shale rock, but we were able to plow the same with a pick plow and two or three teams. Around Powell's Hill there were considerable trees to be cut, so located our line to avoid cutting the best. We reduced the grade at Lothums summer hotel by raising the fill 4 feet and widening. The two hills were solid rock, and the grades were reduced from 8% to 5%. This piece of work was very difficult to handle, owing to the house being so close to the present road. We have stone piled ready for crushing. This stone was taken from the fences along the road, and had to be moved to allow the ditches being made. Owing to lack of machinery we were unable to build permanent culverts or crush the stone. We placed six 18-inch vitrified tile and one 18-inch concrete pipe under the highway and built eight side entrance culverts. East of Brockville, for half a mile, the road was graded and ditched. One rock cut was taken out at the Ontario Hospital.

From Brockville west to the Cemetery, a distance of half a mile, the road was cleared of underbrush, ditches and old culverts cleaned. Three bridges were replanked and guard rails repaired. East of town the road was patched to town line of Augusta with crushed stone.

Construction

	<i>Total Expenditure.</i>	<i>Cost for Township.</i>
One mile earth and rock grading	\$6,465 16	\$1,939 54
1 18-inch concrete tile under highway	121 25	36 37
Side entrance culvert (8 15-inch vit. tile); culverts under highway (6 18-inch vit. tile)	873 27	261 98
Dragging road surface	26 29	7 88
Culvert pipes delivered to road	445 05	133 51
	<hr/> \$7,931 02	<hr/> \$2,379 31

Maintenance

Shoulders graded, ditches cleared, brushed, and road patched	\$1,041 60	312 48
Three bridges replanked	132 99	39 90
	<hr/> \$1,174 59	<hr/> \$352 38
Total cost for township		\$2,731 69

Edwardsburg Township

The road surface on the Provincial highway through Edwardsburg Township was in a very rough condition when taken over, particularly the road for a distance of about one mile westerly from the east boundary. This section was almost impassable for traffic.

The road was graded, shoulders cut off, and crown formed with the road grader for a distance of about seven miles. One and one-quarter miles of road east of Cardinal were given a coat of cinders 10 feet wide by 6 inches deep.

Two miles of road from station 136-44 easterly were very badly drained. This necessitated ditching.

The total cost of above work was \$2,697.61.

The floorings on old timber culverts at station 32-00 and station 223-00 were in a dangerous condition; these were replaced at a cost of \$53.50.

The road from station 136-44 westerly was very narrow. The road was widened out to 30 feet, and standard cross-section constructed, with ditches on both sides for a distance of one mile. Three-quarters of a mile of road was given a coat of gravel 12 feet wide by 6 inches deep.

Fences were removed and the roadway widened out to 86 feet for a distance of three-quarters of a mile.

Three-quarters of a mile of road west of Cardinal was metalled 10 feet wide by 6 inches deep. This stone was shipped from Point Anne Quarries, Point Anne, Ont.

Total cost of above work was \$5,672.35.

One carload of 15-inch vitrified pipe was delivered, and seven 15-inch vitrified pipe culverts were built at side entrances and across the road at a cost of \$455.36.

About 300 cubic yards of concrete and sand have been delivered at culverts for culvert work during the season of 1920 at a cost of \$275.10.

Maintenance

	Total Expenditure.	Cost for Township.
Road surface—grading 7 miles, dragging 7 miles, 1¼ miles cinder road 12 ft. wide, 6 in. deep; two miles ditched	\$2,697 61	\$809 28
Culverts—2 new floorings on old timber culverts	53 50	16 05
	<u>\$2,751 11</u>	<u>\$825 33</u>

Construction

One mile standard cross-section, with ditches: ¾ mile gravelling, 12 feet x 6 inches deep; ¾ mile fences moved and rebuilt on 86 foot line; ¾ mile metalling, 10 feet by 6 inches deep	\$5,672 35	\$1,701 70
Bridges and culverts—300 cubic yards concrete sand delivered on side for culvert construction	275 10	82 53
One carload 15-inch vit. pipe delivered, and seven vit. pipe culverts built at side entrance and across the road	455 36	136 61
	<u>\$6,402 81</u>	<u>\$1,920 84</u>
Total cost for township		<u>\$2,746 17</u>

OTTAWA—PRESCOTT HIGHWAY

The work carried on upon this section of the highway during this period was largely construction work, there being very little expenditure on maintenance. When this road was taken over, the right-of-way was very narrow, being only from 35 to 40 feet wide throughout the greater part of its length. The fences in many places were built of logs and rail, and considerable amounts of rubble stone and boulders had been piled against these fences, with thick brush coming out through and amongst them. For long stretches there were no ditches, and grades were flat or none at all, and brush grew along the roadside up to the edge of the wheel track. At certain seasons of the year long stretches of this road were almost impassable, particularly the section just east of Prescott, the section north of Kemptville to the Rideau River, the section through Cranberry Marsh, in the township of North Gower, and a long section in Nepean Township from near Manotick to near the city of Ottawa.

Edwardsburg Township

Throughout this township old fences have been removed in almost all instances, brush and stumps removed, and the stone piled along fences built into the roadbed over deep fills and through soft areas. Many side entrances to farms have also been constructed. Work was carried on simultaneously at many points with seven different parties of men and teams, each party working under a separate foreman. It cost considerable money to clear the right-of-way and remove rock and other debris. During this season grades of varying heights, from 24 inches to 36 inches, and 30 feet wide on top, were constructed as follows—47,925 feet completed grade; 17,156 feet of grade half completed; 6,100 feet of grade one-third completed.

Of these completed grades, 1,000 feet has been surfaced with water-bound macadam. 25,900 feet has been surfaced with a heavy coat of gravel 25 feet wide, which is now ready for rolling during the coming season. During the season of 1919 a roller was kept working upon the new grade from July 1st to the end of the season, with the object of consolidating the new material. A total of 25,900 feet of this new grade was built on a rubble stone base, and for 31,800 feet it was found necessary, because of the narrow travelled way, to fill the old ditches and make the sides of new roadbed with rock. The cost of the work done in this township was as follows:

The side entrance cost includes a few feet of pipe on the ground, but not placed to date.

On this section 41 reinforced concrete culverts, varying in size from 2 feet x 2 feet, with variable lengths of 33 to 69 feet, to culverts of 17 feet x 8 feet x 38 feet long, as well as the concrete abutments for the Spencerville Bridge, were constructed by contractor Lucius E. Allen, at a cost of \$25,936.80.

Construction

	<i>Total Expenditure.</i>	<i>Cost for Township.</i>
Bridges and culverts	\$25,936 80	\$7,781 04
Earthwork	63,891 59	19,167 47
Road surface	9,231 59	2,769 47
Rockwork	8,241 63	2,474 48
Hauling stone	1,050 55	315 17
Side entrance culverts	1,309 42	392 82
	<u>\$109,661 58</u>	<u>\$32,898 47</u>
Total cost for township		\$32,898 47

Oxford Township

During the season three parties were working in this township under separate foremen, removing fences along the entire length of the road, clearing the right-of-way of brush, stumps and boulders, cutting down hills and building grades having a top width of 30 feet for a distance of over 45,100 feet. Of this finished grade 2,000 feet have been surfaced with crushed stone to a width of 20 feet, and 21,200 feet have been surfaced with a heavy coat of gravel 20 feet wide. Rubble stone base has been placed under 10,000 feet of this new grade, and for 25,033 feet stone fills have been made in the old ditches and across soft areas. A road roller was employed on this section continuously from about July 1st to the end of the season, working on the new grades to consolidate them and get the road in proper shape. A crushing plant was used at Kemptville for about a month. Side entrances to farms were constructed at many points.

This side entrance cost includes a few hundred feet of pipe on the ground, but not placed to date.

Construction

	<i>Total Expenditure.</i>	<i>Cost for Township.</i>
Brushing	\$53 20	\$15 96
Earthwork	44,024 23	13,207 26
Road surface	6,432 90	1,929 87
Rockwork	677 20	203 16
Road foundation material	2,958 50	887 55
Side entrance culverts	429 85	128 96
	<u>\$54,575 88</u>	<u>\$16,372 76</u>

Augusta Township

There was no construction done in this township, but material was delivered for construction. There was one bridge replanked, and a few loads of gravel placed in holes.

All charges included in the following totals for work done in the township of Augusta cover only pay sheets for men and teams and accounts for material used in the construction and maintenance of this portion of the road during the period stated.

Maintenance

	<i>Total Expenditure.</i>	<i>Cost for Township.</i>
Road surface	\$4 80	\$1 44
Bridges and culverts	43 25	12 97
	<u>\$48 05</u>	<u>\$14 41</u>

Construction

Road surface	\$30 42	\$9 13
Side entrance pipes	526 16	157 85
	<u>\$556 58</u>	<u>\$166 98</u>

Summary for Leeds and Grenville Counties

—	Construction	Maintenance	Total	30% Payable by County
	\$ c.	\$ c.	\$ c.	\$ c.
Escott Twp	15,481 28	2,943 62	18,424 90	5,527 47
Yonge Twp. (Front of)	1,223 19	621 65	1,844 84	553 46
Lansdowne Twp	1,090 17	3,024 04	4,114 21	1,234 26
Leeds Twp	1,626 60	5,033 93	6,660 53	1,998 17
Elizabethtown Twp	7,931 02	1,174 59	9,105 61	2,731 69
Edwardsburg Twp. (Ottawa, Prescott) 109,661.58 ; Prescott-Boundary 6,402.81	116,064 39	2,751 11	118,815 50	35,644 64
Oxford Twp	54,575 88	.....	54,575 88	16,372 76
Augusta Township	556 58	48 05	604 63	181 39
	198,549 11	15,596 99	214,146 10	64,243 84

STORMONT, DUNDAS AND GLENGARRY

Williamsburg Township

The road surface on the Provincial Highway through Williamsburg Township, when taken over, was badly rutted. The road was graded, shoulders cut off, and crown formed with the road grader for a distance of about 7 miles. The road surface was patched and holes filled with broken stones. A new flooring was placed on an old timber culvert 9 feet x 5 feet, lot 3.

Two carloads of broken stone were unloaded for bridge construction, at a cost of \$37.10.

One carload of 15-inch vitrified pipe was delivered for side entrances, at a cost of \$322.75.

Maintenance

Total Expenditure. Cost for Township.

Road surface—grading 7 miles; patching holes with broken stone—7 miles	\$1,462 64	\$438 80
Bridges and culverts, one new timber flooring	30 99	9 30
	<u>\$1,493 63</u>	<u>\$448 10</u>

Construction

Bridges and culverts—unloading two carloads of broken stone	\$37 10	\$11 13
Side entrance culverts—one carload of 15-inch vitrified pipe, delivered	322 75	96 82
	<u>\$359 85</u>	<u>\$107 95</u>
Total cost for township		\$556 05

Matilda Township

The road surface on the Provincial Highway through Matilda Township was in a very rough condition when taken over. The road was graded, shoulders cut off and crown formed with the road grader for a distance of about 8 miles. The road was patched throughout with gravel and broken stone. One-half mile of road was given a 6-inch coat of cinders. Ditches were cleaned out, to afford better drainage.

The road west of the Canal Bank Road for a distance of about half a mile was very narrow and badly drained. This necessitated widening the road out to 30 feet and ditching. For a distance of about 200 feet a stone fill was made.

Three miles east of Iroquois, for a distance of one mile, the road was very narrow, and this necessitated widening the road to 30 feet. Ditches were deepened to afford better drainage.

Eighteen 15-inch pipe culverts were constructed at side entrances and across the road. About one mile of road was given a base course of crushed stone 20 feet wide by 6 inches deep. 1,800 cubic yards of crushed stone were placed in a stock pile. This stone was mostly quarry stone from a local quarry; some fieldstone was used.

Maintenance

Total Expenditure. Cost for Township.

Road surface—grading, 8 miles; patching road with gravel and broken stone, 7 miles....	\$1,397 30	\$419 19
Cinder road, ½ mile; culverts—2 12-inch cor. pipe repaired	15 88	4 76
	<hr/> \$1,413 18	<hr/> \$423 95

Construction

Earthwork, 1½ miles; stone fill, 200 feet; road surface	\$5,901 37	\$1,770 41
One mile metalled 20 feet wide x 6 inches deep	11,055 70	3,316 71
1,800 cu. yd. in stock pile	5,460 00	1,638 00
Side entrances—18 15-inch vit. pipe culverts	348 40	104 52
Total cost in township	<hr/> \$22,765 47	<hr/> \$6,829 64

Cornwall Township

The road surface on the Provincial Highway through Cornwall Township was in a very rough condition when taken over. Two and one-half miles of road were graded with the road grader. The road for a distance of some 6 miles was patched with gravel and broken stone. Two washouts at culverts were repaired.

The foundation of the road west of the N.Y. & O. Railway was very unstable. This necessitated putting in a cobble base. In order to obtain a uniform foundation, the surface of the old road was torn up, and a cobble base laid 20 feet wide by 9 inches deep for a distance of about one mile. Fieldstone was used for this work, the average haul being about 3½ miles. Since the freeze-up last fall about 3,000 cubic yards of fieldstone have been hauled to stock piles along the road for construction purposes during the season of 1920. East of Cornwall 1½ miles of road were metalled 12 feet wide by 6 inches deep. Fieldstone was used for this work.

One carload of 15-inch vitrified pipe was delivered, and six pipe culverts were built at side entrances and across the road.

Maintenance

Total Expenditure. Cost for Township.

Grading—2½ miles; patching road with gravel and broken stone, 6 miles	\$822 80	\$246 84
Culverts—repairing two washouts	19 37	5 81
	<hr/> \$842 17	<hr/> \$252 65

Construction

Grading and ditching—1 mile; cobble base 20 feet wide x 9 inch deep, 1 mile; hauling 3,000 cubic yards fieldstone to stock piles.	\$22,194 60	\$6,658 38
Metalling 1½ miles 12 feet wide x 6 inches deep	8,992 50	2,697 75
Side entrances—one carload of 15-inch vitrified pipe was delivered, and six pipe culverts built at side entrances and across the road	460 59	133 18
Moving poles	2 00	60
	<hr/> \$31,649 69	<hr/> \$9,494 91
Total cost for township		<hr/> \$9,747 56

Osnabruck Township

The road surface on the Provincial Highway through Osnabruck Township, when taken over, was in a very rough condition and badly drained. The road was graded, shoulders cut off and crown formed with the road grader for a distance of 10 miles. Six miles of road were maintained with road drags. Holes were patched with gravel and broken stone. A pipe culvert, 12-inch concrete tile, was constructed across the road at lot 7.

The former concrete culvert east of Farran's Point washed out early in June. A concrete bridge 16 feet x 8 feet x 47 feet 6 inches long, with reinforced concrete beams and slabs, was constructed. The road was brought to grade with a 7-foot fill over the bridge. One-third of a mile of road was widened and ditches cut. Two carloads of 15-inch and 18-inch vitrified pipe were delivered for side entrances. Two and one-half miles of road were given a coat of gravel 10 feet wide by 5 inches deep.

Maintenance

	<i>Total Expenditure. Cost for Township.</i>	
Road surface—grading 10 miles, dragging 6 miles	\$1,092 62	\$327 79
Bridges and culverts	20 80	6 24

Construction

Gravelling 10 feet x 5 inch deep, 2½ miles..	\$3,478 55	\$1,043 56
Earthwork—1/3 mile	564 77	169 43
Bridges arc—16 feet x 8 feet x 47.5 feet long	8,589 55	2,576 86
Side entrance culverts—2 carloads 15-inch and 18-inch vit. pipe, delivered	587 47	176 34
	<u>\$14,333 76</u>	<u>\$4,300 13</u>
Total cost for township		\$4,300 13

Lancaster Township

The road surface on the Provincial Highway through Lancaster Township when taken over was in a very rough condition. The existing road is an earth road. The road was graded, shoulders cut off and crown formed with the road grader for a distance of about 7¾ miles. Ditches were cleaned out to afford better drainage. The road was maintained with road drags for a distance of about 9 miles. Weeds were cut and brush cleared from the right of way for some 5 miles.

The timber culvert on lot 1 was straightened up and washout on approaches filled. Two stringers were placed in the timber bridge over Wood's Creek. Six 18-inch con. pipe were placed across the road at the Curry Hill side road.

One thousand seven hundred and sixty cubic yards of fieldstone were piled in stock piles. Two carloads of concrete pipe, sizes 18-inch to 30-inch, were delivered, at a cost of \$892.12. Two and one-half miles of fences were removed and rebuilt on the 86-foot line, and the right of way was cleared of brush, at a cost of \$213.78. A crushing plant was unloaded and set up, at a cost of \$159.85.

Maintenance

	<i>Total Expenditure. Cost for Township.</i>	
Road surface—grading, 7¾ miles; dragging, 9 miles; weeds cut and brush cleared, 5 miles	\$3,022 15	\$906 64
Bridges and culverts—lot 1, culvert straightened; Wood's Creek, 2 new stringers; Curry Hill side road, 6 18-inch con. pipe	63 42	19 03
	<u>\$3,085 57</u>	<u>\$925 67</u>

Construction*Total Expenditure. Cost for Township.*

Road surface—1,760 cubic yards fieldstone placed in stock piles on road	\$4,228 70	\$1,268 62
Side entrance culverts—2 carloads 18 30-inch con. pipe delivered	892 12	267 64
Clearing and grubbing—2 miles	213 78	64 13
Unloading and setting up crushing plant.....	159 85	47 95
	<hr/>	<hr/>
	\$5,494 45	\$1,648 34
Total cost		\$8,580 02
Cost for township		2,574 01

Charlottenburg Township

The road surface on the Provincial Highway through Charlottenburg township was in a very rough condition, and poorly drained, when taken over. About six miles of road were graded, shoulders cut off and crown formed with the road grader. Twelve miles of road were maintained with the road drags. Holes over some five miles of road were patched with gravel and broken stone. At Black River Bridge eleven new stringers and twenty-four planks were put in. New floorings were placed on old timber culverts at lots E, 1 and 26.

Seven thousand cubic yards of fieldstone have been hauled to stock piles along the highway for construction purposes during the season of 1920. About two miles of road were given a heavy coat of gravel, 12 feet wide by 8 inches deep.

Maintenance*Total Expenditure. Cost for Township.*

Road surface—grading, 6 miles; dragging, 12 miles	\$1,043 23	\$312 97
Bridges and culverts—Black River Bridge, 11 stringers, 20 floor planks, 3 new timber floorings to culverts	210 30	63 09
	<hr/>	<hr/>
	\$1,253 53	\$376 06

Construction

Gravelling, two miles, 12 feet wide x 8 inches deep	6,268 63	1,880 59
Road surface—earthwork	311 60	93 48
7,100 cu. yds. fieldstone, delivered to stock piles	10,795 80	3,238 74
	<hr/>	<hr/>
	\$17,376 03	\$5,212 81
Total cost for township		\$5,588 87

Summary for United Counties

	Construction	Maintenance	Total	30% Payable by County
	\$ c.	\$ c.	\$ c.	\$ c.
Williamsburg Twp.....	359 85	1,493 63	1,853 48	556 05
Matilda Twp.....	22,765 47	1,413 18	24,178 65	7,253 59
Cornwall Twp.....	31,649 69	842 17	32,491 86	9,747 56
Osnabruck Twp.....	13,220 34	1,113 42	14,333 76	4,300 13
Lancaster Twp.....	5,494 45	3,085 57	8,580 02	2,574 01
Charlottenburg Twp.....	17,376 03	1,253 53	18,629 56	5,588 87
	<hr/>	<hr/>	<hr/>	<hr/>
	90,865 83	9,201 50	100,067 33	30,020 21

APPENDIX No. 7

MOTOR VEHICLES STATISTICS

W. A. McLEAN,

Deputy Minister of Highways.

SIR,—I have the honour to submit the following statistics for the year 1919 with regard to motor vehicles in the Province of Ontario.

Respectfully submitted.

J. P. BICKELL,

Registrar of Motor Vehicles.

Automobiles

Counties.		Cities.		Total.
Algoma	468	Sault Ste. Marie	661	1,129
Brant	1,355	Brantford	1,136	2,491
Bruce	2,337	.....	.....	2,337
Carleton	1,186	Ottawa	2,778	3,964
Dufferin	1,229	.....	.....	1,229
Dundas	876	.....	.....	876
Durham	1,134	.....	.....	1,134
Elgin	2,185	St. Thomas	771	2,956
Essex	3,919	Windsor	1,820	5,739
Frontenac	947	Kingston	910	1,857
Glengarry	492	.....	.....	492
Grenville	578	.....	.....	578
Grey	2,776	.....	.....	2,776
Haldimand	1,642	.....	.....	1,642
Haliburton	96	.....	.....	96
Halton	1,481	.....	.....	1,481
Hastings	2,507	Belleville	616	3,213
Huron	2,769	.....	.....	2,769
Kenora	59	.....	.....	59
Kent	4,057	Chatham	861	4,918
Lambton	2,488	Sarnia	604	3,092
Lanark	1,253	.....	.....	1,253
Leeds	1,894	.....	.....	1,894
Lennox & Addington	1,100	.....	.....	1,100
Lincoln	2,079	St. Catharines	844	2,923
Manitoulin	314	.....	.....	314
Middlesex	2,534	London	2,570	5,104
Muskoka	345	.....	.....	345
Nipissing	455	.....	.....	455
Norfolk	1,784	.....	.....	1,784
Northumberland	1,646	.....	.....	1,646
Ontario	2,305	.....	.....	2,305
Oxford	2,845	Woodstock	413	3,258
Parry Sound	434	.....	.....	434
Peel	1,376	.....	.....	1,376
Perth	2,089	Stratford	639	2,728
Peterboro	1,064	Peterboro	818	1,882
Prescott	581	.....	.....	581
Prince Edward	1,217	.....	.....	1,217
Rainy River	207	.....	.....	207
Renfrew	1,409	.....	.....	1,409
Russell	360	.....	.....	360
Simcoe	3,777	.....	.....	3,777
Stormont	1,153	.....	.....	1,153
Sudbury	466	.....	.....	466
Thunder Bay	112	Fort William	583	.....
.....	.....	Port Arthur	440	1,135
Temiskaming	339	.....	.....	339
Victoria	1,513	.....	.....	1,513

Counties.		Cities.		Total.
Waterloo	2,236	Kitchener	951	
		Galt	332	3,519
Welland	1,902	Welland	570	
		Niagara Falls	719	3,191
Wellington	1,835	Guelph	883	2,718
Wentworth	2,140	Hamilton	4,948	7,088
York	3,463	Toronto	21,747	25,210
	80,898		46,614	127,512
		Foreign . . .		348
				127,860

Occupations

Farmers	46,997	
Business	13,837	
Tradesmen	15,042	
Professional	5,119	
Manufacturers	4,362	
Doctors	3,157	
Firms	1,714	
Liverymen	3,442	
Travellers	3,219	
Agents	4,709	
Real estate agents	644	
Insurance agents	819	
Contractors	2,238	
Undertakers	319	
Labourers	1,250	
Managers and foremen	5,595	
Police	195	
Drovers	557	
Unclassified	5,194	
Unoccupied	8,146	
Municipal corporations and public service	279	
Private corporations, banks and railways	151	
Soldiers	521	
Dominion Government	39	
Ontario Government	112	
Royal Air Force	31	
Military units	16	
Munition Board	17	
Department of Soldiers' Civil Re-establishment	91	
Department of Militia and Defence	47	
Military hospitals	1	
		127,560

Herse Power

Fords, 22.5	59,306	
15	240	
16-20	16,420	
21-25	32,178	
26-30	15,219	
31-35	2,409	
36-40	1,293	
41-45	382	
46-50	233	
51 and up	26	
Electric	154	
		127,860

Motive Power

Gasoline	127,705	
Electric	155	
		127,860

Registrations

New registrations	27,596	
Renewal registrations	100,264	
		127,860

Descriptions

Touring	113,930	
Runabout	8,471	
Coupe	2,339	
Sedan	2,828	
Taxi	212	
Bus	80	
		127,860

COMMERCIAL VEHICLES

Counties and Districts.		Cities.		Total.
Algoma	14	Sault Ste. Marie	67	81
Brant	64	Brantford	174	238
Bruce	24	. . . . .	. . . . .	24
Carleton	40	Ottawa	539	579
Dufferin	28	. . . . .	. . . . .	28
Dundas	19	. . . . .	. . . . .	19
Durham	29	. . . . .	. . . . .	29
Elgin	42	St. Thomas	15	57
Essex	282	Windsor	262	544
Frontenac	24	Kingston	112	136
Glengarry	1	. . . . .	. . . . .	1
Grenville	13	. . . . .	. . . . .	13
Grey	81	. . . . .	. . . . .	81
Haldimand	33	. . . . .	. . . . .	33
Haliburton	2	. . . . .	. . . . .	2
Halton	114	. . . . .	. . . . .	114
Hastings	66	Belleville	70	136
Huron	66	. . . . .	. . . . .	66
Kenora	3	. . . . .	. . . . .	3
Kent	55	Chatham	85	140
Lambton	58	Sarnia	69	127
Lanark	19	. . . . .	. . . . .	19
Leeds	42	. . . . .	. . . . .	42
Lennox and Addington	55	. . . . .	. . . . .	55
Lincoln	135	St. Catharines	245	380
Manitoulin	13	. . . . .	. . . . .	13
Middlesex	90	London	394	484
Muskoka	11	. . . . .	. . . . .	11
Nipissing	21	. . . . .	. . . . .	21
Norfolk	39	. . . . .	. . . . .	39
Northumberland	67	. . . . .	. . . . .	67
Ontario	130	. . . . .	. . . . .	130
Oxford	62	Woodstock	77	139
Parry Sound	13	. . . . .	. . . . .	13
Peel	109	. . . . .	. . . . .	109
Perth	43	Stratford	48	91
Peterborough	29	Peterborough	101	130
Prescott	15	. . . . .	. . . . .	15
Prince Edward	47	. . . . .	. . . . .	47
Rainy River	3	. . . . .	. . . . .	3
Renfrew	35	. . . . .	. . . . .	35
Russell	8	. . . . .	. . . . .	8
Simcoe	149	. . . . .	. . . . .	149
Stormont	26	. . . . .	. . . . .	26
Sudbury	58	. . . . .	. . . . .	58
Thunder Bay	9	Fort William	103	. . . . .
. . . . .	. . . . .	Port Arthur	46	158
Temiskaming	45	. . . . .	. . . . .	45
Victoria	56	. . . . .	. . . . .	56
Waterloo	95	Kitchener	128	. . . . .
. . . . .	. . . . .	Galt	60	283
Welland	144	Niagara Falls	28	. . . . .
. . . . .	. . . . .	Welland	45	217
Wellington	36	Guelph	73	109
Wentworth	205	Hamilton	689	894
York	450	Toronto	4,390	4,840
	3,317		7,820	11,137
		Foreign		291
				11,428

COMMERCIAL VEHICLES

Occupations

Farmers	825
Business	2,705
Tradesmen	532
Professional	19
Manufacturers	458
Doctors	20
Firms	3,076
Liverymen	268
Travellers	24
Agents	417
Real Estate Agents	1
Insurance Agents	3
Contractors	1,758
Undertakers	225
Labourers	53
Managers and Foremen	57
Police	2
Drovers	16
Unclassified	116
Unoccupied	108
Municipal Corporations and Public Service	197
Private Corporations and Banks and Railways	344
Soldiers	5
Dominion Government	32
Ontario Government	48
Royal Air Force	3
Military Units	7
Munition Board	2
Dept. of Soldiers' Civil Re-Establishment	24
Dept. of Militia and Defence	78
Military Hospitals	5

11,428

11,428

Capacity

½ ton	1,526
1 "	8,254
1½ "	524
2 "	528
2½ "	57
3 "	171
3½ "	193
4 "	37
4½ "	4
5 "	110
5½ "	4
6 "	12
6½ "	5
7 tons and up	3

Total 11,428

11,428

Motive Power

Gasoline	11,373
Electric	55
Steam .....	.....

11,428

11,428

Registrations

Originals	3,784
Renewals	7,644

11,428

11,428

Descriptions			
Delivery	.....	2,469	
Trucks	.....	8,718	
Ambulance	.....	85	
Hearse	.....	138	
Casket Wagon	.....	11	
Patrol	.....	7	
		<hr/>	
		11,428	
		<hr/>	
			11,428

MOTORCYCLES

Counties and Districts.		Cities.		Total.
Algoma	20	Sault Ste. Marie	51	71
Brant	34	Brantford	53	87
Bruce	22			22
Carleton	36	Ottawa	185	221
Dufferin	13			13
Dundas	9			9
Durham	26			26
Elgin	16	St. Thomas	25	41
Essex	65	Windsor	68	133
Frontenac	15	Kingston	38	53
Glengarry	3			3
Grenville	6			6
Grey	52			52
Haldimand	19			19
Haliburton				
Halton	39			39
Hastings	26	Belleville	22	48
Huron	35			35
Kenora	1			1
Kent	36	Chatham	24	60
Lambton	26	Sarnia	17	43
Lanark	15			15
Leeds	22			22
Lennox and Addington	7			7
Lincoln	44	St. Catharines	39	83
Manitoulin	1			1
Middlesex	52	London	122	174
Muskoka	4			4
Nipissing	15			15
Norfolk	18			18
Northumberland	21			21
Ontario	54			54
Oxford	59	Woodstock	20	79
Parry Sound	3			3
Peel	68			68
Perth	35	Stratford	41	76
Peterborough	16	Peterborough	22	38
Prescott	7			7
Prince Edward	26			26
Rainy River	7			7
Renfrew	34			34
Russell	7			7
Simcoe	79			79
Stormont	10			10
Sudbury	4			4
Thunder Bay	1	Fort William	36	
		Port Arthur	22	59
Temiskaming	22			22
Victoria	21			21
Waterloo	64	Kitchener	48	
		Galt	59	171
Welland	95	Niagara Falls	63	
		Welland	28	186
Wellington	13	Guelph	27	40

Counties and Districts.		Cities.		Total.
Wentworth	69	Hamilton	330	399
York	256	Toronto	2,523	2,779
	1,648		3,863	5,511
		Foreign		5
				5,516

MANUFACTURERS AND DEALERS

Counties and Districts.		Cities.		Total.
Algoma	7	Sault Ste. Marie	6	13
Brant	1	Brantford	10	11
Bruce	14	. . . . .	. . . . .	14
Carleton	1	Ottawa	28	29
Dufferin	5	. . . . .	. . . . .	5
Dundas	7	. . . . .	. . . . .	7
Durham	4	. . . . .	. . . . .	4
Elgin	8	St. Thomas	10	18
Essex	15	Windsor	20	35
Frontenac	2	Kingston	10	12
Glengarry	2	. . . . .	. . . . .	2
Grenville	2	. . . . .	. . . . .	2
Grey	25	. . . . .	. . . . .	25
Haldimand	6	. . . . .	. . . . .	6
Haliburton . . . . .	. . . . .	. . . . .	. . . . .	. . . . .
Halton	14	. . . . .	. . . . .	14
Hastings	14	Belleville	8	22
Huron	17	. . . . .	. . . . .	17
Kenora	4	. . . . .	. . . . .	4
Kent	24	Chatham	15	39
Lambton	10	Sarnia	6	16
Lanark	9	. . . . .	. . . . .	9
Leeds	17	. . . . .	. . . . .	17
Lennox and Addington	4	. . . . .	. . . . .	4
Lincoln	2	St. Catharines	13	15
Manitoulin	2	. . . . .	. . . . .	2
Middlesex	6	London	17	23
Muskoka	2	. . . . .	. . . . .	2
Nipissing	6	. . . . .	. . . . .	6
Norfolk	8	. . . . .	. . . . .	8
Northumberland	15	. . . . .	. . . . .	15
Ontario	36	. . . . .	. . . . .	36
Oxford	8	Woodstock	5	13
Parry Sound	1	. . . . .	. . . . .	1
Peel	8	. . . . .	. . . . .	8
Perth	8	Stratford	4	12
Peterborough	2	Peterborough	10	12
Prescott	3	. . . . .	. . . . .	3
Prince Edward	6	. . . . .	. . . . .	6
Rainy River	2	. . . . .	. . . . .	2
Renfrew	11	. . . . .	. . . . .	11
Russell	3	. . . . .	. . . . .	3
Simcoe	22	. . . . .	. . . . .	22
Stormont	12	. . . . .	. . . . .	12
Sudbury	1	. . . . .	. . . . .	1
Thunder Bay	2	Fort William	5	. . . . .
. . . . .	. . . . .	Port Arthur	4	11
Temiskaming	3	. . . . .	. . . . .	3
Victoria	10	. . . . .	. . . . .	10
Waterloo	6	Kitchener	8	. . . . .
. . . . .	. . . . .	Galt	4	18
Welland	9	Welland	7	. . . . .
. . . . .	. . . . .	Niagara Falls	13	29
Wellington	3	Guelph	5	8
Wentworth	8	Hamilton	43	51
York	13	Toronto	184	197
	430		435	865
		Foreign		213
				1,078

CHAUFFEURS

Counties.		Cities.		Total.
Algoma	124	Sault Ste. Marie	181	305
Brant	58	Brantford	192	250
Bruce	132			132
Carleton	47	Ottawa	527	574
Dufferin	10			10
Dundas	52			52
Durham	76			76
Elgin	35	St. Thomas	107	142
Essex	158	Windsor	335	493
Frontenac	38	Kingston	144	182
Glengarry	29			29
Grenville	69			69
Grey	229			229
Haldimand	45			45
Haliburton	12			12
Halton	82			82
Hastings	193	Belleville	129	322
Huron	224			224
Kenora	14			14
Kent	110	Chatham	125	235
Lambton	68	Sarnia	73	141
Lanark	98			98
Leeds	128			128
Lennox and Addington	84			84
Lincoln	55	St. Catharines	176	231
Manitoulin	42			42
Middlesex	55	London	539	594
Muskoka	39			39
Nipissing	86			86
Norfolk	41			41
Northumberland	160			160
Ontario	210			210
Oxford	146	Woodstock	92	238
Parry Sound	32			32
Peel	38			38
Perth	81	Stratford	67	148
Peterborough	55	Peterborough	183	238
Prescott	33			33
Prince Edward	75			75
Rainy River	14			14
Renfrew	60			60
Russell	23			23
Simcoe	361			361
Stormont	84			84
Sudbury	56			56
Thunder Bay	3	Fort William	73	
		Port Arthur	43	119
Temiskaming	105			105
Victoria	120			120
Waterloo	85	Kitchener	130	
		Galt	89	307
Welland	211	Niagara Falls	146	
		Welland	111	479
Wellington	16	Guelph	65	81
Wentworth	4	Hamilton	1,033	1,078
York	229	Toronto	6,102	6,231
	4,689		10,662	15,351
		Foreign		49
				15,400
Registrations.				
Originals				6,329
Renewals				9,071
				15,400
Chauffeurs—No fee				1,009

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LIST OF PUBLICATIONS ISSUED BY THE DEPARTMENT OF PUBLIC HIGHWAYS

Pub. No.	Title.
9.	Report of the Ontario Highways Commission, 1914.
10.	Regulations respecting Township Road Superintendents, 1916.
11.	Regulations respecting County Roads, 1920.
14.	Township Road Improvement, 1918.
15.	The Motor Vehicles Act, The Highway Travel Act, The Load of Vehicles Act, The Public Vehicles Act, 1920.
16.	General Specifications for Concrete Highway Bridges, 1917.
17.	General Specifications for Steel Highway Bridges, 1917.
18.	Highway Bridges, 1917.
19.	General Plans for Steel Highway Bridges, 1917.
20.	Description of Road Models Exhibit, 1917.
21.	Short Forms for Bridge Tenders, 1917.
22.	Report on Street Improvement, 1917.
23.	Bituminous Surfaces for Macadam Roads, 1917.
24.	Specifications for Bituminous Materials, 1917.
25.	County Road Legislation, as enacted by The Highway Improvement Act, The Ontario Highways Act, and The Obstructions on Highways Removal Act, 1920.
26.	Motor Vehicle Headlamps and Glare Elimination, 1918.
27.	Widening the Provincial Highway, 1919.
28.	Main Road Legislation, 1919.
29.	Regulations respecting Township Roads, 1920.
30.	Township Road Legislation, as enacted by The Ontario Highways Act, 1920.
31.	Motor Vehicle Headlamps.



ANNUAL REPORT

OF THE

Department of Public Highways

ONTARIO

1920

PRINTED BY ORDER OF
THE LEGISLATIVE ASSEMBLY OF ONTARIO



TORONTO:

Printed by CLARKSON W. JAMES, Printer to the King's Most Excellent Majesty.

1922



HIGHWAYS, WATERWAYS AND SHORE LINES OF ONTARIO

A relief map in perspective showing how Provincial Highways, Northern trunk roads and a few County Road Connections will ultimately make a valuable asset of lakes and rivers, attracting to Ontario the tourists of the continent.

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To His Honour Lionel H. Clarke,

Lieutenant-Governor of the Province of Ontario

May it please Your Honour:—

I herewith beg to present for your consideration the Annual Report of the Department of Public Highways, relating to Highway Improvement in the Province of Ontario.

Respectfully submitted,

F. C. BIGGS,

Minister of Public Works and Highways.

To the Honourable F. C. Biggs,
Minister of Public Works and Highways,
Ontario.

Sir,—I have the honour to submit the Annual Report of the Department of Public Highways for the year 1920, having special reference to work on the Provincial Highway System under the Provincial Highways Act; work carried on by the several counties of Ontario under the Highway Improvement Act; and by township councils whose work is now subsidized under the Ontario Highways Act, 1920.

Reference is also made to the operation of the Motor Vehicles Act; and to other services within the purview of the Department of Public Highways.

I have the honour to be, Sir,

Yours respectfully,

W. A. McLEAN,

Deputy Minister of Highways.

Parliament Buildings, Toronto, April 26th, 1921.



In 1919, before improvement.



In 1920, after improvement.

ON THE HAMILTON-QUEENSTON PROVINCIAL HIGHWAY
NORTH OF STONEY CREEK.

ANNUAL REPORT OF THE Department of Public Highways

Report of W. A. McLean, Deputy Minister

Good roads confer national and local benefits to an extent and magnitude difficult to realize or compute. The benefits of good roads are interwoven with the three sources of national wealth, Agriculture, Industry and Commerce, in a manner so diffused that it is impossible to summarize in statistics or other means the vast influence which they exert upon national and individual prosperity.

Canada, under conditions before the war, had but a light national burden, and the wastefulness of bad roads was a handicap which the wealth and resources of the country could sustain with comparative ease. To-day, with conditions reversed in many particulars, the urgent necessity is for economy, for lessened cost of production, and for increased production, in all of which good roads are an essential form of equipment. It would be blind oversight to continue to equip agriculture, industry and commerce with refinements of machinery and labour-saving devices, while the merits of good roads in this respect are overlooked.

ECONOMY OF LABOUR

It is an essential principal of good roads, that a comparatively small amount of labour is put into their construction and maintenance, in order that a great saving of energy may be effected in haulage and transportation over them; and in order that additional travel and transportation over them (the evidence of national growth) may be encouraged.

The Toronto and Hamilton Highway may be cited as an example in this regard. Before construction, there was comparatively little through travel between these two cities. Forty miles of clay and sand roads were a barrier rather than a means of communication. Since construction, motor bus and motor truck services have been established, the daily traffic ranges from 1,500 to 3,000 vehicles at different points, commercial needs are being served, agricultural development has been markedly benefited, and a continuous line of homes is growing up, varying from the numerous shacks of thrifty working men, to the country residences of millionaires. All this development has been made possible at a cost equal to the wages of four men per mile of road, working continuously through the year. This covers interest, maintenance, and refunding of the bonds.

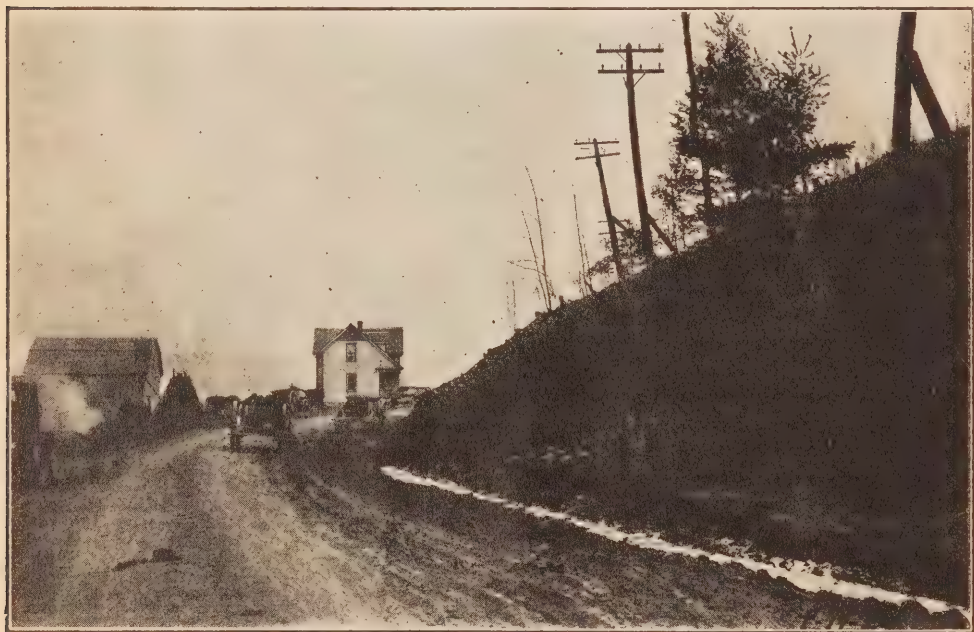
A HIGHWAY IMPROVEMENT FUND

The year 1920 has been notable by reason of very marked advance in highway legislation. A Highway Improvement Fund has been established, consisting of the unexpended balance of the monies previously appropriated for road purposes; \$3,000,000 annually for a period of five years; the revenue from motor vehicle fees after deducting sufficient to provide for interest and sinking fund in respect of the foregoing issue of bonds; all repayments to the Province by municipalities on account of Provincial Highway construction (amounting to twenty per cent. of the total cost); and monies received from the Government of Canada. In addition to the foregoing, a special appropria-

tion of \$7,000,000 for the year was credited to the Highway Improvement Fund. The Fund has thus been placed on a more stable basis. Further provision will be necessary to meet the growing needs of the Province, but the basis of a very substantial means of finance has been created.

PROVINCIAL HIGHWAYS

Approximately 1,178 additional miles of road were designated as Provincial Highways in 1920, making a total of 1,600 miles of the most important roads of the Province included in the Provincial Highway System to date. During 1920, a total of \$4,491,895.81 was spent on these roads, 205 miles being graded, 195 miles gravelled, 37 miles of water-bound macadam, 10 miles of bituminous macadam, one-half mile of bituminous concrete and 14½ miles of cement were constructed; also 92 miles of macadam base. While the balance of the roads were maintained to the best standard possible considering the condition of the material and labour market. In addition to this road work, 16 bridges and 653 culverts were built.



Before improvement.

“Cape Horn,” on the Hamilton-Queenston Highway, East of Beamsville.

An analysis of the expenditure on Provincial Highways shows that a refund of \$737,099.11 is to be anticipated from municipalities, and \$1,426,843.00 from the Dominion Government under the Canada Highway Act, a total of \$2,163,942.11 to be anticipated in refunds, with \$2,327,953.70 as a definite charge on the Province. This includes the sum of \$449,189.58 spent on road repairs; and approximately \$1,049,099.43 on plant and equipment, gravel pits and other property of permanent value.

The Provincial Highway System as now designated comprises the leading roads of the Province. Connecting and radiating from the urban centres they are, as a class, the most heavily travelled roads. Municipalities had

found the task of their maintenance more than they could cope with, the roads had got out of repair, and an immediate expenditure for repair was urgently needed. In spite of the short period within which work could be organized and carried on during the year, a substantial amount of this work was overtaken and many portions of these leading roads will be found in a reasonable state for traffic of 1921. It is expected that by the end of the current year, the entire system will have been gone over in a preliminary manner and reasonable service provided.

The most permanent part of highway construction is the earth work, drainage, culverts and bridges. The surface continually wears out and has to be renewed. The work on Provincial Highways, in addition to repairs for immediate safety and service, has been largely of a most permanent character.

The objective of the Highway Department, a connected system of main highways throughout the Province, is measurably within reach, and as previously indicated, the year 1921 will see a substantial development of the links which were not repaired or constructed in 1920.



"Cape Horn," after improvement.

The folly of placing expensive surfaces on insufficiently prepared sub-grades is apparent to all who are familiar with the effect of the Canadian climate on roads as they have existed, and on new railway construction. Only time and a measure of wear can produce sufficient settlement and consolidation, in the highway sub-grade to satisfactorily support the so-called permanent surface. The surfaces of gravel and crushed stone now being generally laid by the Department are not only necessary for immediate traffic requirements, but are essential in obtaining and permitting settlement, and will provide an ideal base on which to lay more durable surfaces where rendered necessary by heavy traffic.

COUNTY ROADS

The year 1920 saw every County in the Province constructing and maintaining roads under the County Road System and earning the Provincial subsidy. At the present time the Department is paying subsidies to the counties on 9,725 miles of county roads—about eighteen per cent. of the roads in the counties—including 1,704 miles of Provincial County Road, or about nineteen per cent. of the total county road mileage.

Expenditures for the year on County Roads were as follows:—

	Total Expenditure.	Provincial Grant.
Maintenance.		
Provincial County Roads	\$ 556,479.95	\$ 333,898.77
County Roads	1,666,436.40	666,574.47
Total Maintenance	\$2,222,916.35	\$1,000,473.24
Construction.		
Provincial County Roads	\$1,661,865.22	\$ 997,119.13
County Roads	4,072,125.85	1,628,850.43
Total Construction	\$5,733,991.07	\$2,625,969.56
Summary.		
Total Maintenance	\$2,222,916.35	\$1,000,473.24
Total Construction	5,733,991.07	2,625,969.56
Total Expenditures	\$7,956,907.42	\$3,626,442.80

In addition to the maintenance of 9,725 miles of county roads the work on which the foregoing expenditures were made, including the following construction:—

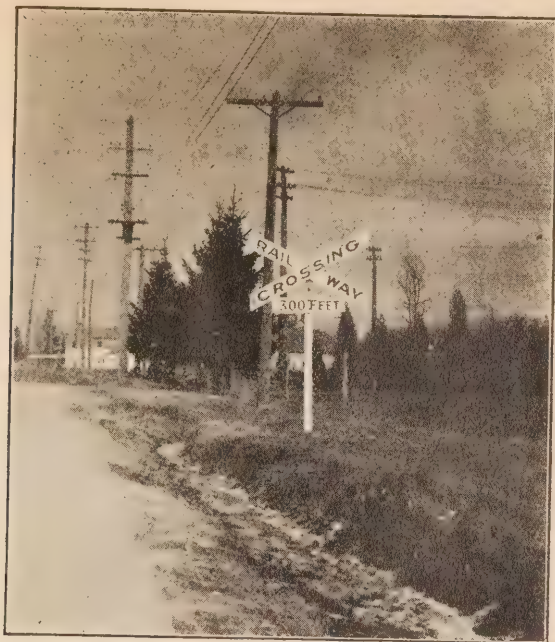
Grading	188.68 miles
Gravelled surface	136.77 "
Waterbound macadam	190.72 "
Cement concrete	11.23 "
Bituminous penetration	37.68 "
Asphaltic concrete	6.11 "
Vetrified brick .....	.81 "
Total surfaced	383.32 miles
Bridges over 10 feet span	128
Pipe and tile culverts	1,331
Other culverts	281

TOWNSHIP ROADS

At the 1920 session of the Legislature, provision was made whereby a subsidy of twenty per cent. might be paid to Townships on their expenditure on roads; and 184 townships took advantage of this aid during 1920, spending \$1,631,460.12 and receiving subsidies aggregating \$326,291.95.

Previous to 1920, a subsidy of twenty-five per cent. (but not exceeding \$150.00) was paid toward the salary of a township road superintendent. This percentage has now been increased to forty per cent. without restrictions. As a result, 115 townships appointed superintendents during the year 1920, and received subsidies on their salaries, amount to \$14,707.03.

One of the great merits of the financial aid to townships, is that it is enabling the Department to bring direct and definite organizing and technical advice to the township councils; and from this source alone, most desirable results are assured.



Standard sign at railway crossings.

ROAD COSTS

Road costs have in every country been greatly increased since the war in common with the general trend of prices. In Great Britain road costs are estimated as being three times greater than before the war. On this continent they have been approximately doubled.

The total cost of the road is largely proportionate to the cost of common labour. Materials used in the road are the product of labour. Transportation of these materials is the product of labour. The value of stone in the quarry bed is negligible in the cost of the road. The cost of stone for the road is created by quarrying, crushing, transporting it, and consolidating it in the road bed. The same is true of cement and other materials. It requires as many days of labour now as before the war to build a road. The cost of a day's labour has doubled; therefore, the cost of the road has doubled.

One school of thought would contend that because of this increased cost, road-construction should be delayed until costs have lowered. This may be true of non-essential roads. But those who are in intimate contact with the road situation know that there are roads, the construction of which cannot be delayed except at an economic loss vastly in excess of the increased cost. Conditions of unemployment are also such as to fully justify this work as a means by which a transition period of distress and unemployment may be shared by the nation rather than a few unfortunate individuals. Public works have always been deemed justifiable for various economic reasons during periods of depression, and the present is no exception to the rule.

Expenditure on highways at the present time is undoubtedly a "shock absorber," of economic value, in relieving the stress of financial and labour conditions following the war.

PROGRESSIVE DEVELOPMENT

The road policy of the Department has been one of progressive development. Time is an essential consideration in the building of roads if the best results are to be attained. Certain types of surface construction which have been successful in England have failed on this continent; the reason being that in England they have laid on old and well-settled foundations; whereas, on this continent the attempt has been made to obtain an earth grade, drainage, foundation and wearing surface as one work and in one season. Uneven settlement and failure has been the inevitable result. Railway engineers know that on many new earth grades, appreciable settlement continues for at least three years.

By "progressive development" in road building is meant the method by which an earth grade is built one season, with merely sufficient gravel or stone surfacing to carry traffic. Work on the foundation is continued the following season; and by the third year the road bed is ready for the final surface.

By reason of this policy, very considerable expenditures have been necessary on earthwork, bridges, culverts and foundation before the final stage has been reached; and much misunderstanding has resulted. Foundations laid by the Department have been locally assumed to be the finished road, and, wearing to a rough condition, have been criticized. The Department has been fully aware of the principle that roads of the macadam and gravel type are not suitable for conditions of heavy traffic. Neither are they suitable for foundation until they have been subjected to one or two season's wear, to "take out the settlement" such as occurs on these roads in Spring and Autumn. Macadam and gravel construction is excellent for foundation purposes. It may be used for traffic temporarily; and this temporary traffic is of the greatest value in improving the road as a foundation.

"Progressive road development" utilizing time, weather and traffic which cost nothing, is a means of economy, of durability and of general efficiency which this country in its road policy cannot afford to neglect.

DRAGGING THE ROADS

Experience in the maintenance of Provincial Highways, and certain county road systems, has demonstrated fully that the dragging of earth and gravel roads is of the greatest advantage. Were townships to establish adequate organization for dragging their gravel roads, a wonderful improvement would result in the road system of the Province. A steel drag with three blades, known as a "road-plane" is extremely effective in keeping a gravel road in the best possible condition. A light coating of moderately fine gravel should be added annually, if possible, to keep a floating surface over the gravel. Without this floating layer of gravel, an inch or so in depth, there is nothing for the plane to work with, to keep depressions and holes filled. Care must also be taken not to cover the gravel with earth or clay by drawing the latter from the edges of the road with the plane.

Over half the roads of the Province are gravelled. Systematic dragging of these roads would work a revolution in road conditions such as no other method would produce. Dragging can also be extended to earth roads with splendid results. But this plan of maintenance is not applicable to stone roads unless they are first covered with a light layer of suitable clean gravel or very fine crushed stone.

MOTOR VEHICLE REGISTRATION

Registration of Motor Vehicles (which is under the supervision of the Department of Public Highways) was as follows for the year 1920: —

Passenger Cars	155,861
Motor Trucks	16,204
Motor Cycles	5,496
Manufacturers and Dealers	1,462
Chauffeurs	19,563

These registrations show an increase over the year 1919 of 28,001 passenger cars, and 4,776 motor trucks.

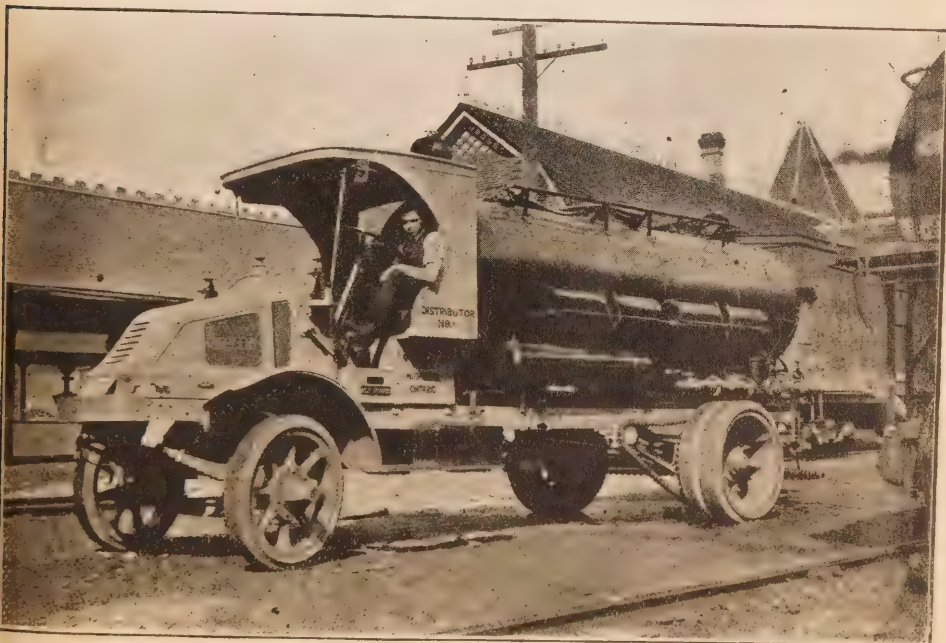
A classification according to occupations shows that 57,429 farmers are owners of passenger cars, or 36.8 per cent. of the total; and that farmers own 1,273 trucks, or 7.9 per cent. of the total.

In horse-power, 132,768 passenger cars are under 25 horse-power; and 18,569 between 25 and 30 horse-power. Only 4,395 are over 30 horse-power.

In the case of trucks, 13,476 are one-ton trucks or under; and 895 are registered as one and a half ton or under. There are 1,542 trucks of from two-ton to three and one-half-ton capacity; and only 291 are over three and one-half-ton capacity.

MOTOR CAR ACCIDENTS

Accidents may be divided into two classes; those which are unavoidable and those which are avoidable. The driver of every motor vehicle, in spite of all skill and care, is subject to the possibility of an accident; and generalities with respect to accidents placing the responsibility on the driver of the car, are unreasonable and unjust. Steering gear or other mechanism may go out of order; or when an adult pedestrian steps without warning from the curb, directly in front of a moving car, no form of traffic regulation will prevent accident.



Modern Equipment for Oiling and Tarring.
Oil distributor used by the Highways Department.



The Ottawa-Prescott Highway.

In its original condition, narrow, fences filled with stone and brush, without grading or drainage.

Excessive speed is the most prolific cause of accident, and is a form of careless and reckless driving. To this source, the majority of avoidable accident may be traced. The present speed law permits a maximum speed within urban municipalities of twenty miles an hour, to be reduced to ten miles at street intersections. With this speed is coupled the obligation placed upon the driver of a motor vehicle to drive with due care under all circumstances; so that on occasion a speed of five miles, or any movement at all, may be illegal. A former maximum speed of fifteen miles an hour unduly limited the usefulness of the motor car, and placed the driver in an unfortunate position legally, under the ordinary methods of speed enforcement. To overcome excessive speeding on city streets, a more rigorous enforcement of the present law should be applied, keeping motorists strictly within the speed laws. Were this done, the speed limitations would be found adequate.

Too many accidents occur to children. The presence of children on a street should be a warning to the driver of a motor car to drive with extreme care. The horn should be sounded to warn children playing on the sidewalk that a motor car is approaching. Children absorbed in play are thoughtless irresponsible, and it is the plain duty of the driver of a motor vehicle to recognize these conditions. That a child runs from the sidewalk in front of a motor car is not always a sufficient excuse for an accident; for the driver of a motor vehicle, if he is competent to drive, should know that children do such

things, and he should be reasonably prepared for the emergency. Accidents to children are in many cases an evidence of reckless driving.

Accidents to pedestrians are caused in a degree by an unfortunate attitude of mind which belongs to some drivers, and which assumes that the pedestrian will get out of the way of the vehicle. Such a driver, instead of reducing speed and bringing his vehicle under sufficient control, merely toots



A finished section of the Ottawa-Prescott Highway.

the horn. Should the pedestrian fail to leap to safety, or should he become confused, stand still, or turn back, an accident results. The driver of a motor car should have the vehicle under such control that the ordinary pedestrian is not endangered, particularly at street intersections.

On the other hand, some pedestrians are careless and unreasonable in their attitude to motor cars. They loiter on the roadway, and in front of motor cars, to a degree that invites accident. They are willing to accommodate themselves to other pedestrians or to horse-drawn vehicles, but in the case of motor cars, their mental attitude is one of antagonism. They ignore the fact that the movements of the pedestrian are much more readily controlled than those of a motor car.

Were pedestrians to exercise more care in leaving the curb; and were motorists to remember that pedestrians, particularly children, are apt to leave the curb carelessly, the number of accidents on city streets would be much reduced.

Glaring headlights are a fruitful cause of accidents, particularly on country roads; and a simplified method of determining and overcoming glare is greatly to be desired, in order that the anti-glare law may be more effectively enforced.

On country roads, excessive speed is still the most prolific cause of accident. Passing other vehicles on hills, at curves, and at intersections where vision is interrupted, is merely evidence of the desire for speed in its most dangerous form. There is need that all main highways be patrolled by officers on motor cycles, in order that reckless driving may be prevented.

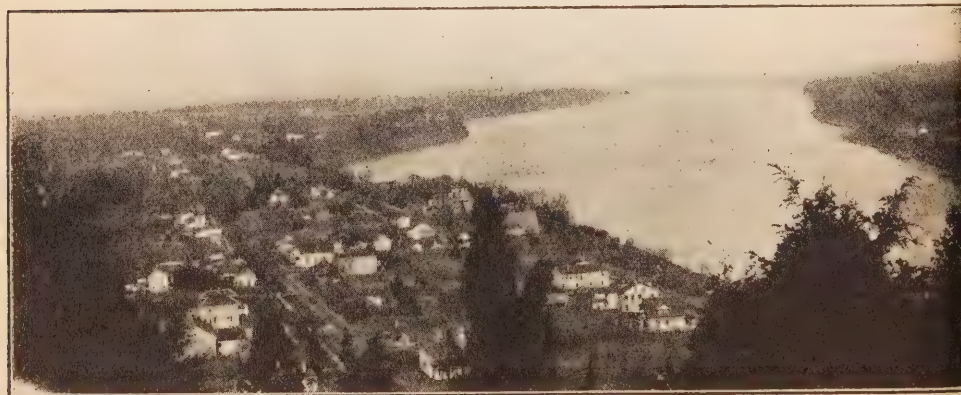
TRAFFIC LAW ENFORCEMENT

Enforcement of provisions of the Motor Vehicles Act, the Highway Travel Act, and the Load of Vehicles Act rests primarily with municipal authorities. Fines are payable to the municipalities except in cases where conviction has been procured by an officer of the Province. Special legislation in the case of the Toronto and Hamilton Highway places the onus of traffic law enforcement upon the Commission to which fines are payable; and a similar situation exists with respect to the Department of Public Highways in relation to Provincial Highways.

Provincial Highways have been merely in process of development, and to the present time, have not afforded much opportunity for speeding, but an increasing need for patrol by traffic officers is becoming evident.

Convictions reported to the Department for the year 1920 have been as follows:—

Speeding	Motor Vehicles Act, Sec. 11 s.s. (1)	11,317
Reckless Driving	" " " " 11 " (2)	450
Not registering change of address	" " " " 3 (a)	131
No driver's license	" " " " 4 s.s. (1)	28
No gong, no horn	" " " " 6 " (1)	3
No mirror	" " " " 6 " (1b)	194
No lights	" " " " 6 " (2)	1,301
No markers	" " " " 8 " (1)	129
No rear light	" " " " 8 " (3)	635
No proper markers	" " " " 9 " (1)	33
Dirty markers	" " " " 9 " (2)	68
Revolving lights	" " " " 9 " (3)	56
Defaced markers	" " " " 9 " (5)	52
Driver under age	" " " " 13	18
Driver intoxicated	" " " " 14	189
Passing standing street car	" " " " 15	254
Passing street car on left	" " " " 15 " (d)	44
Excessive noise	" " " " 16 " (2)	11
Not returning to accident	" " " " 18 " "	21
Hiring car unlawfully	" " " " 18 " (a)	2
Racing	" " " " 12	1
Miscellaneous		35
Total number of convictions		14,972
Total of fines		\$110,753.50
Total of costs		45,534.58



The Niagara River at Queenston
View at the terminus of the Provincial Highway.

The amounts of fines, as previous pointed out, are payable to the municipality. Of the foregoing amounts, the City of Toronto collected \$23,820 in fines on 2,850 convictions; the City of Hamilton, \$5,133 and \$329.25 costs, with 1,022 convictions; the City of Ottawa, \$1,986 and \$267.50 costs, with 138 convictions; and the Toronto-Hamilton Highway Commission \$37,051 fines and \$21,060 costs, with 5,262 convictions.



The Ottawa-Prescott Highway in course of construction.

OUTLOOK FOR ROADS

There is reason for much optimism for the future of roads in Ontario. Township councils, under municipal management, have gravelled and improved many miles; and county councils have been doing much excellent work on the leading market roads within each county. The Provincial System in the course of three or four years, by energetic effort, and adequate financial support, will connect up this local improvement in a manner that will place old Ontario in a most enviable position with respect to common roads.

This work, co-ordinated in the Highway Department, will each year add an increasing efficiency of maintenance that is essential from the day a road is built.

Steam railways, harbours, steamship lines, electric railways are all desirable in their place, but without good roads to feed them, they cannot exist. The good country road is primary; all other means of transportation exist in order that they may carry the produce, and serve the traffic that grows up along the common road. The Province cannot be adequately developed until the common roads are in keeping with the splendid natural resources.



Scene on the Provincial Highway.
Magnificent view of "The Long Sault" near Cornwall.

Report on County and Township Roads

By DISTRICT ENGINEERS

W. A. McLean, Esq.,
Deputy Minister of Highways,
Ontario.

Toronto, April the 29th, 1921.

Sir:—

I have pleasure in handing you herewith a summary report on the work carried out on County Roads during the year 1920 in the Counties of Ontario, Victoria, Peterborough, Northumberland and Durham, Prince Edward, Hastings, and Lennox and Addington, in accordance with the provisions of the Highway Improvement Act.

It is gratifying to note the steady progress the townships in the various Counties are making towards road improvement. A large number of townships during the past year have sought Government aid, in accordance with the Government regulations.

It is a recognized fact that even though the war is over, the supply of unskilled labor, such as is largely employed on highway work, is not yet adequate to meet the demand. Labor forms a large percentage of the cost of improved roads, and labor is not only scarce, but the price is high. The same is also true of some of the materials that enter into road construction, so the net result is that but little over one half of the mileage can be built for the same amount of money as was built in pre war days.

At the present time the completed roads on the County System are in a fair state of repair, but the money available for construction and maintenance has not increased materially, although the mileage has increased and is being added to year by year. In some of the Counties this additional mileage is an added drain on the money available. These roads must be reconstructed and resurfaced, so unless there is an ample supply of money available for this purpose the roads will deteriorate. It is gratifying to note that some of the Counties see the danger of such a policy, and refrain from asking for more mileage. When the conditions become more favorable no doubt work of an extensive nature will be carried out by all Counties.

Respectfully submitted,

JOHN A. McVICAR,
District Engineer.

ONTARIO

The County of Ontario has 182 miles of County Roads, and 60 miles of Provincial County Roads under its jurisdiction, or 15.8% of the total road mileage within the County. With such a reasonable percentage ratio, and given a fair appropriation, this County should be able to show good results from the money spent.

Among the prominent physical features of the County are a great many streams which drain it. These bridges and culverts have to be built to provide cross drainage upon the roads. During the past few years much money has been expended upon these

structures, care being taken to make them permanent by the use of concrete and steel. During the past year the work carried out consisted mainly in the reconstruction of culverts and bridges. Some 8 reinforced concrete bridges with spans varying from 12 to 60 feet were built, also a number of culverts with spans of five to eight feet. Bridge building is now nearing a completion in the County, so that we may confidently expect road construction to be prosecuted with greater vigor in the near future.

Systematic maintenance was carried out on all the roads so far as the money available would allow. It consisted of dragging, patching holes, and the resurfacing with a thin coat of gravel, long stretches of road. In addition some grading was done for side ditches, and some extensive hill cutting.

The chief units of machinery purchased during the year were: 18 to 36 h.p. Kerosene Tractor, Grader, 2 Scarifiers and Spreading Wagons, making the equipment more suitable for modern road building.

VICTORIA

Victoria has 69 miles of Provincial County Roads, and 160 miles of County Roads, or a total of 229 miles under its jurisdiction. This makes 21.5% of the total road mileage. The County Roads are in the southerly six townships of the County. The physical features of the County make a number of problems in road construction that will be expensive. Among these are some hills to be cut down, swamps to be graded, and bridges built.

The program of grading and gravelling in this County was an extensive one for the year. The construction consisted of the grading of about 17 miles, and the metalling of about $8\frac{1}{2}$ miles of road. A number of concrete and concrete pipe culverts were built on these roads. In addition, two 16-foot span, and one 40-foot span bridges were built of reinforced concrete. The total mileage, including the work of construction, shows in all $26\frac{1}{4}$ miles of roads surfaced with gravel, and $9\frac{1}{8}$ miles surfaced with crushed stone.

Maintenance was a very large item in this year's expenditure. Resurfacing of roads with gravel or crushed stone was carried out on about 12 miles.

A steam shovel with dump wagons was employed to build a grade across two stretches of swamp, each one half of a mile in length. For this purpose a borrow pit convenient to each section of the road was opened up. In these, the steam shovel was used to fill the dump wagons, the wagons hauled by team to the end of the grade and dumped. In this manner these long stretches of grade were built without undue expense.

The machinery items added during the year include the following: An Excavator (steam shovel), Tractor, Grader, 10 Dump Wagons, 4 Wheel Scrapers, 9 Steel Drags, and 2 Storage Tanks, which with a few smaller items amounted to nearly \$15,000.00.



Another view of a completed section of the Ottawa-Prescott Highway.

PETERBOROUGH

Peterborough was the last County to come into the good roads scheme of the Government. It has 238 miles in the County Road System, 40 miles of Provincial County Roads, and 18 miles of suburban. This totals 296 miles under the County Road System, or 32.6% of the total road mileage within the area covered by the County Road System. This is very much in excess of the usual mileage that a County can take care of. It is the second largest percentage in the Province, and much in excess of what the people are willing to provide funds to construct and maintain in proper shape.

During the year there was expended upon maintenance of the Provincial County Roads \$2,430, of which \$1,743 was for resurfacing. Upon the County Roads there was expended \$14,688, of which \$10,272 was expended upon resurfacing and \$2,062 upon bridges. Upon the Suburban Roads there was expended \$9,170, mostly on resurfacing. There was \$10,349 spent upon machinery. For this amount one new crusher, 3 wheel scrapers, 5 graders and 10 small blade graders, and 6 plows were purchased.

The program as outlined by the Superintendent is to bring the roads up to a fair degree for the travelling public, and later start construction.



Moving Earth by Steam Shovel.

On the Provincial Highway much modern equipment is used in making permanent improvements.

NORTHUMBERLAND & DURHAM

The County Road mileage amounts to 277 miles, and the Provincial County Roads 116 miles, making a total mileage of 393 miles under the County jurisdiction. This makes the County Roads 14.4% of the total road mileage in the County. Even with this reasonable percentage, and granted the appropriations are sufficient, careful work will be necessary to care for the roads.

Road construction throughout the Counties was largely a matter of grading out the side ditches, using the material to raise the shoulders, then hauling gravel and spreading it to give a new wearing surface.

The greater part of the grading operations was carried out with a 17-34 h.p. Tractor, pulling a heavy blade grader. Rapid progress was made in this way in the construction of side ditches. A large yardage was moved at low cost. This cleaning of old ditches and the construction of new greatly improved the drainage along these roads. Some hill improvement was made in a few places.

Upon the Provincial County Roads considerable construction was undertaken. In the townships of Seymour and Brighton, upon road number 38, a stretch of six and one quarter miles was graded. Of this amount 4 miles was metalled with crushed stone or gravel.

The average haul of the metal was about $3\frac{1}{2}$ miles. In the grading operations considerable earth had to be hauled from borrow pits, as it was considered cheaper than moving the sides, which were of a very rocky nature. In this stretch, 44 pipe culverts were built, and one reinforced concrete culvert. This construction ran into approximately \$34,000.00.

On the County roads about $3\frac{1}{4}$ miles of road was constructed, the grading and metalling amounting to something over \$10,000. One bridge of 51 foot span, with reinforced concrete abutments and steel superstructure, was built at a cost of practically \$4,500.00. The floor was a concrete slab.

In maintaining the County Roads nearly \$51,000.00 was spent. Of this amount over \$11,000.00 was spent in grading, about \$2,000.00 in culverts, over \$32,000 in resurfacing with gravel or crushed stone, and over \$2,000.00 in dragging.

Special grants to towns and villages amounted to \$17,000.00.

PRINCE EDWARD

Prince Edward County has 105 miles of County Roads and 45 miles of Provincial County Roads, or a total of 150 miles. This works out at 24.1% of the total road mileage in the County. This percentage is above the average for the Counties of Ontario, and perhaps more than the funds available will properly care for.

A considerable sum was expended upon the maintenance of the Provincial County Roads during the past year. In resurfacing with gravel or crushed stone over \$11,500.00 was spent, and on oiling nearly \$1,300.00.

On construction work upon County Roads \$35,000.00 was expended. The work consisted of grading and metalling with crushed stone, $6\frac{3}{4}$ miles of road; laying 37 culverts and building one reinforced concrete culvert.

The enlarged program of work on the roads necessitated the purchase of more machinery. Among the larger units added were a steam roller and an engine. Other smaller and less expensive units were also added.

The crushed limestone used on the roads in Prince Edward shows unevenness in its wearing qualities. Some of the rock is soft and shaly, and does not long resist wear.

In the Village of Wellington, where the traffic has been heavy, the road was reshaped and resurfaced in a more substantial way than the usual macadam road. Tar was used as a binder, and a fine type of road resulted.



Elevated Track for Unloading Stone.

Contractors plant used in building the Provincial Highway in Haldimand County.

HASTINGS

The County of Hastings has 369 miles of County, and 130 miles of Provincial County Roads, or a total of 499 miles. This works out at 34.6% of the total road mileage in the area covered by the County Road System. It is far above the average, being considerably in excess of any other County percentage in Ontario. There can be but little doubt that the mileage is far in excess of what the people are able or willing to build and maintain. The result is going to be a process of slow, but inevitable deterioration of the County System.

The County includes much flat or rolling country, studded with many swamps and streams. Of the latter, three large rivers are important features, namely the Trent, Moira and Salmon. The bridging of these streams, and their tributaries is a serious problem, and takes up a large share of the monies appropriated for road improvement.

Hastings has been a long time in the County System, and at the inception took over for the most part old gravelled roads. These radiated in different directions from the chief market centres. In many cases the ditches which were originally formed along these roads have long since filled up, while in other cases practically no grading has ever been done. Apparently the metalling has been laid down on the existing flat surface. Another great difficulty in the majority of the roads in the County is their width. The original surveys allowed approximately 40 feet for right of way. Before attempting work of a substantial character the road allowance should now be widened to 66 feet. So far, however, no serious attempt has been made to have the property owners set their fences back, so as to allow the proper use of modern road building machinery.

The roads in the County System do not show the improvement one would expect. This is due to a number of reasons, and among these may be mentioned the following:

- (a) The narrow width of the right of way, which for many roads is 40 feet, or thereabouts, precludes the possibility of using modern road building machinery to advantage, and so drainage is wanting or neglected.
- (b) The ideal of the road superintendent is to cover mileage of roads with surface material, rather than adapting a well balanced policy of construction and maintenance.
- (c) The heavy drain which bridge construction has made on County appropriations.



Putting Stone Into Stock Pile for the Provincial Highway.

It would have been a wiser policy to have specialized on bridge construction and drainage, and to have limited the addition of roads to the System to the amount of funds available for their proper consideration and maintenance.

The worst grade on any road effectively limits the traffic. Grades may be avoided or reduced by relocation or by cut and fill. The best practice is to establish once and for all a defined and permanent grade and alignment. It need not follow that the entire road is to be graded at once, but a start can be made and year by year the road will progress toward a final satisfactory profile.

In these respects Hastings has a Provincial County Road running as far north as Maynooth. This road could well be relocated by an engineer. The expenditures on the present road surface will later have to be abandoned. At present, the alignment is un-

necessarily crooked, with a number of excessive grades that could be greatly reduced, or perhaps avoided.

During the past year the work for the most part consisted of resurfacing with gravel and trimming shoulders. One or two short sections of construction work were undertaken.

On the Provincial County Roads there was expended nearly \$76,000 on maintenance; of this about \$14,000, was for grading and \$59,000 for resurfacing with gravel or crushed stone. In addition small amounts were spent on culverts and bridges.

On the County Roads over \$66,000 was spent, of which less than \$6,000 was for grading and nearly \$57,000 on resurfacing. Nearly \$3,200 was spent on bridges and culverts. In addition, one 45-foot span reinforced concrete bridge was built.

About \$10,400 was spent on machinery, the chief items being: two crushers, 3 graders, 1 scarifier, pick plow and 3 drags.

LENNOX AND ADDINGTON

There are 110 miles of County Roads, and 79 miles of Provincial County Roads, or a total of 189 miles of road under the jurisdiction of the County Council. The townships in which this mileage lies are in the south of the County. The mileage comprises 24.4% of the total road mileage in the area covered by the County System. This percentage is somewhat high for effective road construction and maintenance in view of the appropriations available.

On the Provincial County Roads, a distance of $1\frac{3}{4}$ miles was graded at a cost of about \$1,300.00. A Road Survey was made of road No. 6, running south from Napanee to Adolphustown, a distance of about 18 miles. This was undertaken with the view of widening the road allowance to the full 66 feet, preliminary to the reconstruction of the road, in accordance with the regulations of the Department. A culvert of 10-foot span was also built on road No. 6.

A considerable amount of resurfacing was done during the year. In this, both gravel and crushed stone were used, the total expenditure amounting to over \$31,000.00. This County should pay more attention to its side drainage while undertaking large resurfacing programs.

Upon the County Roads in N. Fredericksburg a mile and one half was graded and metalled at a cost of \$4,400.00.

Special grants to villages amounted to over \$11,000.00, expended upon grading and metalling.

The maintenance consisted of resurfacing, on which over \$21,000.00 was spent. For this purpose both gravel or crushed stone were used. A number of small culverts were constructed upon these roads.

The following units were added to the machinery during 1920: one J.I. Case Grader, and 2 Bell Engines.

Toronto, January the 15th, 1921.

W. A. McLean, Esq.,
Deputy Minister of Highways,
Ontario.

Sir:—

I have the honour to submit a summary report of the work carried out under the Highway Improvement Act, and Ontario Highways Act during 1920 in the following Counties, viz:—Elgin, Essex, Huron, Kent, Lambton, Lanark, Middlesex, Norfolk, Oxford, Prescott and Russell, Renfrew and Stormont, Dundas and Glengarry.

During the year special visits were made besides the regular County inspection trips, at the request from the various municipalities.

Many of the townships availed themselves of the aid as provided for in the 1920 legislation of the Ontario Highways Act, and other townships are making arrangements to take this aid in 1921. Statute Labour has either been abolished, or commuted in many of the townships.

It is gratifying to note that there has been a general improvement on all County work, but the need in a few Counties is for systematic maintenance.

Labour conditions during 1920 held back considerable construction work, but the outlook for 1921 is good.

All of which is respectfully submitted,

J. A. P. MARSHALL,
District Engineer.

ELGIN COUNTY

Elgin County at the end of 1920 had 262 miles of roads under the County Road System, of which 164 miles are County Roads, 38 miles Provincial County Roads, and 15 miles Suburban Roads adjacent to City of St. Thomas. During 1920, 58 miles of roads have been taken over by the Province as Provincial Highways.

Approximately 150 miles of County Roads have been resurfaced with broken stone or pit gravel, and numerous small culverts lengthened by iron pipes or tile. During 1920, Elgin County continued to carry out the well defined system of maintenance in regard to gravel roads.

Expenditure classed as construction includes the labour and material necessary to construct 4 miles of stone road, the grading and tiling of 5 miles of road, the building of two concrete bridges on County Road No. 41, a new creosote wood block floor on the McIntosh Bridge over the River Thames. In addition, 5 reinforced concrete culverts were constructed and 62 pipe culverts laid.

Over 900 cords of gravel have been hauled by motor trucks from the County Pit, and placed on different roads within a radius of 12 miles, and over 300 cords of gravel hauled by teams, and placed on roads in the vicinity of the pit.

A number of options have been secured on gravel pits in view of putting in mechanical loaders, and it is the intention of the County Council to purchase several more motor trucks.

Township Aid.

Elgin has the distinction of being the first county in Ontario to have its quota of townships complete in the matter of taking township aid. The townships of Yarmouth, Bayham and Malahide appointed Township Road Superintendents. Yarmouth in 1917, and Southwold in 1918, did away with statute labour, while Aldborough and South Dorchester have commuted statute labour.

ESSEX COUNTY

The present County Road mileage of Essex County is 265 miles, of this 209 miles are County Roads, 38 miles Provincial County Roads, and 15 miles Suburban Roads. During the year 58 miles were taken over as Provincial Highways.

On Road No. 1 (Windsor Suburban Roads), Essex County has completed the construction of the 18-foot concrete roadway on the Huron Line in Sandwich West, from the Prince Road in the Town of Sandwich to the Marais Road, a distance of 1½ miles. The contract for this work was let in 1919, and commenced late in the fall of same year. On Road No. 8, the 18-foot concrete roadway on the Tecumseh Road from the Pilets Road to the bridge over Little River, in Sandwich East, a distance of two miles, was completed.

An 18-foot concrete roadway was constructed on the Front Road, Sandwich East, and completed through the Village of St. Clair Beach for a distance of 1¾ miles. A bituminous penetration road was constructed on the Pike Road in Malden Township from the second to third concession. On several clay roads considerable light gravelling has been done, and is much appreciated by the users of the roads.

The County owns a large gravel pit which is equipped with a modern loading device. Two trucks were purchased late in the season, and were used for the balance of the season in resurfacing gravel roads within truck haul of the pit.

Township Aid.

The townships of Rochester and Sandwich East were the only two townships to take advantage of the Government aid. The Township of Sandwich East appointed a township road superintendent.

HURON COUNTY

The mileage of the Huron County Road System at the end of 1920 was 403 miles, of which 47 miles are Provincial County Roads. During the year the Huron Road from Goderich to Dublin, a distance of 25 miles, was assumed as a Provincial Highway.

In the Village of Exeter, approximately one mile of concrete roadway was constructed. Considerable gravelling has been done on various sections of the County Road system.

At Grand Bend, over the Aux Sable River, a new bridge of 130-foot span has been erected. This structure consists of a steel truss and concrete abutments. Early in the nineties a cut was made through here by the Dominion Government, and this undermined the old stone abutments to some extent, and the last few years the old structure was in a

dangerous condition. Owing to the delay during 1920, it was well on in the season before the steel truss could be erected. The concrete floor will be laid in 1921. This is a boundary line bridge between Huron and Lambton Counties.

On County Road No. 24, opposite Lot 15, Concession XIII, Ashfield Township, the old timber structure, known as the Buckingham Bridge, was replaced with an imposing reinforced concrete deck girder bridge, with three spans of 27 feet, 50 feet, and 30 feet respectively, and is a splendid example of neat design in reinforced concrete construction. The cost was approximately \$11,000.00. Sader's Bridge on County Road No. 27B, consisting of two spans of 34 feet, through girder of reinforced concrete design, was built at a cost of approximately \$4,700.00. A number of small reinforced concrete slab bridges were also erected. Huron County, with most of the large permanent structures built on the county roads, will now be able to devote more attention to the roads.

During the year two crushers were purchased, and two gasoline tractors, besides a number of drags.

Township Aid.

The following townships took advantage of the Government aid, and also appointed township road superintendents—Hay, Hullett, Stephen, Colborne, Morris, Turnberry and Usborne. The following townships did not appoint a township road superintendent, but took the 20% aid,—Stanley, E. Wawanosh, Howick, W. Wawanosh, Ashfield and Goderich. Thus, out of the sixteen townships in Huron, only three failed to take advantage of Government aid, these being Grey, Tuckersmith and McKillop. These will probably be in line for 1921.



Immediately East of the City of Belleville.

An 86-foot road allowance provides ample space for the roadway, ditches, sidewalks, pole lines and trees.

KENT COUNTY

Kent County's mileage of roads under the County Road System consisted of 249 miles for 1920, of this mileage 40 miles are designated as Provincial County Roads, 200 as County Roads, and 9 miles as Suburban Roads adjacent to the City of Chatham. During 1920, 88 miles of roads were assumed as Provincial Highways.

The most important construction work undertaken by Kent County during 1920 was the extension of a concrete road on the River Road north of Chatham, in Dover Township. The length laid in 1920 was 4,306 lineal feet at a width of 16 feet. This is on a suburban road adjacent to the City of Chatham. On Provincial County Road No. 62, northerly from the Town of Wallaceburg, a concrete pavement 6,796 lineal feet in length and 16 feet wide was laid. On Provincial County Road No. 79, just south of the Village of Thamesville, the Duff's Creek Bridge has been partially erected. This bridge consists of a 50-foot span with a 20-foot clear roadway.

A number of gravel pits have been purchased by the County during 1920, and it is the intention of the County to do considerable resurfacing on many of the County Roads.

Considerable drainage assessment has been paid out during the year on County Roads, and a number of culverts erected.

Township Aid.

The only townships to take advantage of Township aid during 1920, were the Townships of Zone and Orford. Both these townships have statute labour.

LAMBTON COUNTY

Lambton County Road mileage at the end of 1920 was 345 miles, of which 76 are designated as Provincial County Roads, 266 miles County Roads, and 3 miles Suburban Roads, adjoining the City of Sarnia. During the year 40 miles of road were assumed as a Provincial Highway. On Provincial County Road No. 81, the Grand Bend Bridge was erected. This is over the Aux Sables River at Grand Bend, and is on the boundary between the Counties of Lambton and Huron. Among other bridges erected during 1920 was Wood Creek Bridge, Bannister Bridge and the Inwood Bridge. Fifty-three culverts were constructed, and approximately 1,500 rods of tile drains laid.

During 1920 the County bought two motor trucks, and operated them from the County pit just north of Petrolea. With the aid of these trucks considerable mileage of roads were surfaced with gravel, and good results have been obtained.

Approximately \$36,000.00 was paid out for new machinery by the County, the important units being two motor trucks and trailers, one steam shovel, one tractor, and two heavy graders.

Township Aid.

During 1920 the following townships appointed a township road superintendent, and partook of the 20% aid on construction and maintenance:—Sarnia and Enniskillen: while Plympton and Bosanquet townships passed by-laws for expenditure only. Enniskillen has commuted statute labour.



The Rouge Hill.

Near Toronto, formerly a serious obstacle to traffic.

LANARK

Lanark County has 224 miles of roads on the County Road System, of which 40 miles are designated as Provincial County Roads, and 184 miles as County Roads. During the year 32 miles of roads were assumed as Provincial Highways.

During the year considerable work was done on the Provincial County Road No. 83, Northerly from the Town of Perth for about 2½ miles, a tar penetration road being constructed. On this road in the Smith Falls Suburban Road area, 2 miles of penetration surface 16 feet wide was constructed, and one mile of stone base laid.

On County Road work, 12.5 miles of crushed stone have been laid, and 38 culverts constructed. During the year considerable machinery was added to the County equipment.

Lanark, with the work as carried out during the last few years, has made splendid progress on the construction of more durable roads.

Township Aid.

The Townships of Ramsay, Drummond, Bathurst, and North Elmsley, took advantage of the 20% grant on township roads. Ramsay appointed a township road superintendent in addition to taking aid.

MIDDLESEX COUNTY

At the end of 1920 Middlesex County had 439 miles of roads under the County Road System, of which 47 miles are designated as Provincial County Roads, 360 miles as County Roads, and 32 miles as Suburban Roads. During the year 102 miles of roads were assumed as Provincial Highways.

The only construction work undertaken on Provincial County Roads was the erection of a reinforced concrete slab bridge of 10-foot span, on the Sarnia Gravel Road, opposite Lot 7, Adelaide Township, with a clear width of roadway of 26 feet. This cost \$957.25, and is a great improvement over old conditions. The grade on either approach has been widened to the Provincial County Road standard.

On County Road No. 3, a new reinforced concrete slab bridge has been built on Con. III, N. E. R., Adelaide Township, and the concrete floor completed on a bridge on Road No. 17c., E. Williams, and on a bridge on Road No. 28, in the Town of Strathroy. Twelve miles of grading and ten miles of gravelling have been done on County Roads and 27 smaller culverts laid. Six gravel pits have been purchased by the County during the year.

One hundred and thirty miles of County Roads have been resurfaced with gravel, as maintenance work, besides considerable light grading.

During the year two motor trucks for placing gravel on the County Roads were purchased by County as well as 11 graders and a tractor. The expenditure for new machinery was approximately \$26,000.00, for 1920.



The Rouge Hill.

Straightened, widened, and with a substantial bridge.

Township Aid.

During 1920 the following townships appointed a township road superintendent:— Delaware Lobo and Biddulph, as well as participating in the 20% aid on township roads. Delaware Township and Lobo Township have abolished statute labour during 1920. The following townships took the 20% aid:— Westminster, Caradoc, Ekfrid, North Dorchester and London. Westminster abolished statute labour in 1919, and Caradoc and Ekfrid in 1920.

NORFOLK COUNTY

The mileage of roads at the end of 1920 under the County Road System in Norfolk County was 226 miles, of which 28 miles are designated as Provincial County Roads. During the year 32 miles of roads were taken over as Provincial Highways.

The most important work on Provincial County Roads was the continuation of a bituminous penetration surface on the Simcoe-Port Dover Road. It is the intention of the County to complete this roadway into Port Dover during 1921. This work cost approximately \$44,000.00, being slightly over 2 miles in length.

On County Road No. 9, northerly and westerly from Port Rowan, the base course for a bituminous penetration surface was laid for a distance of 3,500 feet. Considerable tile draining has also been done here. On County Road No. 8, considerable grading and hill cutting has been done. On County Road No. 17, from County Road No. 29, westerly to Vanessa Station considerable gravelling was undertaken. On Road No. 8, Concession 7, Walsingham, the Overflow Bridge started in 1919, was completed; extensive heavy hill cutting and grade reduction has made a great improvement over the old conditions in this locality. On Road No. 17, the Leeson Bridge of 16-foot span was built at a cost of approximately \$2,100.00.

During the year approximately \$30,000.00 was spent on new machinery. This included the purchase of two steam rollers, two motor trucks, a cement mixer, a stone crusher, besides other smaller equipment.

The organization for County Road purposes in Norfolk County is good; with a definite plan as laid out by the county officials, results attained during the last few years are bearing out the wisdom of such a course, and other counties would benefit by the adoption of such a plan.

Township Aid.

During the year the Townships of Woodhouse and Windham took up the matter of Township Aid. The approved expenditure made on township roads in 1920, for Woodhouse, was \$8,893.78, and in Windham \$10,038.26. Both these townships were visited and the township officials interviewed. Woodhouse has commuted statute labour.



Hill at Ancaster.

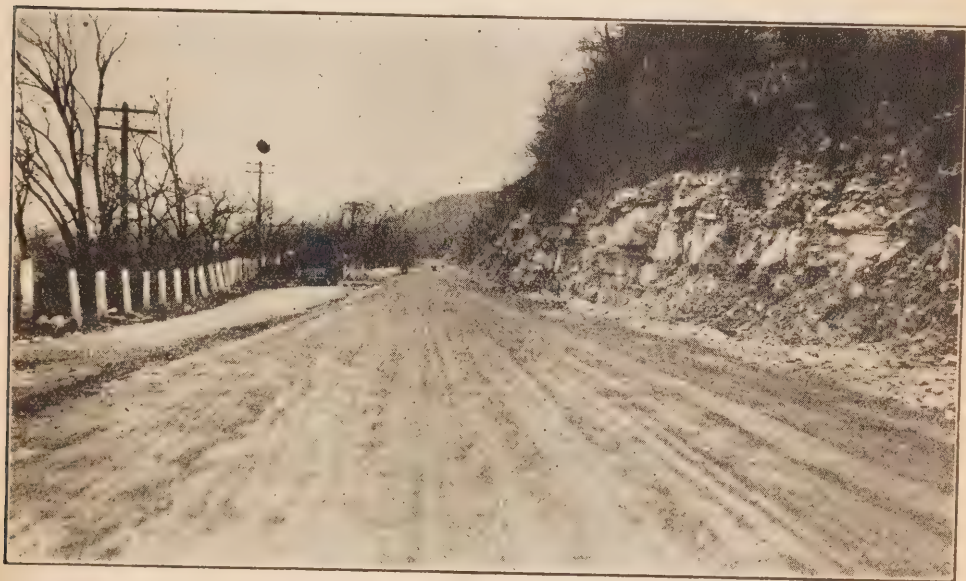
Narrow, winding, before improvement.

OXFORD COUNTY

Oxford County at the end of 1920 had approximately 276 miles of County Roads, of which 26 miles are Provincial County Roads, and 250 miles County Roads.

Oxford County during the last year has been doing considerable gravelling on many of their County Roads.

Oxford County's organization for county road purposes is a purely township one, and might be considerably improved on. Under the present by-law by which Oxford is operating the townships have practically the say as to what amount shall be spent on construction and maintenance, and where this is to be spent. The petitions of the various townships are sent in to the county council at the March session, and the allotment asked by each township is generally allowed. Some townships are well off for gravel, others are not. There seems to be no general co-operation between the townships, and one township during 1920 objected to a grading outfit, consisting of a tractor and grader coming into their township, when the crew did not consist of ratepayers in that particular township.



Hill at Ancaster.

Widened and straightened by moving a comparatively small amount of earth.

There is great need for immediate and proper maintenance work to be carried on throughout the County. Oxford during the past decade has spent a very large sum of money raised by debentures, on construction of their county roads. The great need in Oxford now is to maintain these roads to a reasonable standard. This will necessitate a great many more patrolmen being employed, along with an adequate supply of machinery. During 1920, one foreman had to look after 55 miles of County Roads in one particular township as well as being the Township Road Superintendent in that township. In all, for the 276 miles, there were during 1920 not more than a dozen maintenance foremen on the County Roads, and in some cases the responsibility was left with the Reeves. It is absolutely imperative that this system of county road affairs be changed.

During 1920 special grants have been made to the villages and towns. It should be here emphasized that the Government subsidy is only allowed on construction work, and not on maintenance and repair work in towns and villages.

It is earnestly desirable that a proper system of road accounts and book-keeping be kept by the County Road Superintendent.

Township Aid.

During 1920, the following townships took advantage of the Government aid of 20%, and also appointed Township Road Superintendents:—Dereham, South Norwich and North Norwich, East Zorra, West Zorra, Blenheim and Blandford. The remaining two townships of East Oxford and East Nissouri, will probably take the Government aid in 1921. The townships of Dereham, West Zorra, East Zorra, and North Norwich, have abolished statute labour.

PRESCOTT AND RUSSELL

At the end of 1920 Prescott and Russell had 171 miles of roads under the County System. During the year, County Road No. 32, from New Orleans to Pointe Fortune, a distance of 59 miles, was assumed as a Provincial Highway.

On Provincial County Road No. 32, there were 4.25 miles of bituminous macadam built. A special grant of \$8,000.00, was made to the Town of L'Orignal. On County Roads there were 1.87 miles of gravelling, 12.1 miles of waterbound macadam, and 7.58 miles of bituminous macadam constructed during the year. Most of this work was done by contract.

A number of bridges have been constructed, including the St. Berwardin, Lefavre, Moose Creek, Scotch River Bridges, and Boundary Bridges.

During the year approximately \$40,000.00 was spent on new machinery, which included three motor trucks.

Township Aid.

The Townships of Clarence, Cumberland and South Plantagenet, appointed Township Road Superintendents, and took advantage also of the 20% aid on township road work.

RENFREW COUNTY

At the end of 1920, the mileage under the jurisdiction of the County of Renfrew, consisted of 256 miles, of which 60 miles are Provincial County Roads, and 196 miles County Roads.

Considerable construction work was carried out on Provincial County Road No. 96; this work was done on three sections, viz.:—

- (1) Town line Stafford, and Alice Townships, Con. II-III, Stafford, to Lots 27 and 28, Con. II, Stafford, thence easterly a distance of 1.4 miles, consisting of waterbound macadam, crushed granite being used.
- (2) From G. T. Railway intersection at Renfrew Junction westerly to Lots 10 and 11, Con. III, Adamston Township, a distance of 2.1 miles, waterbound macadam, using field stone and crushed granite.
- (3) From Lots 6 and 7, Concession VIII, Bromley line to Lots 10 and 11, Concession VIII, Bromley, approximately 0.7 miles of waterbound macadam was built, using crushed boulders.

From intersection with G.T. Railway at Renfrew Junction, easterly to Bank Street, in Town of Renfrew, 0.7 miles of bituminous macadam were built, under a special grant from the County.

On County Roads the chief construction work was the building of 2.5 miles of waterbound macadam road from Arnprior, northerly to Lot 13, Concession B, of McNab Township. The Dochant Bridge was built here on Lot 7 at a cost of \$5,580.00. One mile of gravelling was done on County Road No. 10, in Wilberforce Township.

Approximately \$40,000.00 was paid out by the County of Renfrew for machinery in 1920, the chief units of which were three road rollers, one tractor and one rock crusher.

Renfrew County has a good organization for carrying out the work; the chief feature being the establishing of road camps.

Considerable survey work and preliminary grading has been done throughout the County in preparation for future work.

Township Aid.

The Townships of McNab and Alice availed themselves of township aid for 1920, and in both these townships road superintendents were appointed.

STORMONT, DUNDAS AND GLENGARRY

The mileage under the County Road System consisted of 399 miles at the end of 1920. Of this mileage 126 miles are designated as Provincial County Roads, and 273 miles as County Roads.

Stormont, Dundas and Glengarry has the distinction of having the largest expenditure on County Roads of any of the counties for 1920. On Provincial County Roads, 24.5 miles of crushed stone roads were constructed. On County Roads, 27.5 miles of surfacing was done with crushed stone, and two miles with gravel. The work was done by contract or day labour.

Approximately \$44,000.00 was spent on new machinery during 1920. The chief units were three road rollers, two crushers and one tractor.

Stormont, Dundas and Glengarry are operating under a County System, and have a good organization.

Township Aid.

The following townships took advantage of the Government aid by appointing a township road superintendent, and taking aid on construction and maintenance:—Lancaster, Charlottenburg, Kenyon, Cornwall, Finch, Winchester and Williamsburg.

W. A. McLean, Esq.,
Deputy Minister of Highways,
Ontario.

Toronto, April the 26th, 1921.

Sir:—

I have the honour to submit a summary report on the work carried out on County Roads during the year 1920, in the Counties of Brant, Bruce, Carleton, Dufferin, Frontenac, Grey, Leeds and Grenville, Perth, Simcoe, Wellington and Waterloo, in accordance with the provisions of the Highway Improvement Act.

In addition to the regular Departmental inspection, a number of special visits were made during the year at the request of the County officials, where matters of special importance were being considered. The assistance of the Department in all such cases appeared to be very much appreciated.

It is very gratifying to report that the work as a whole showed a marked improvement and a greater tendency to maintain the roads in such a way as to lay the foundation for future construction.

Respectfully submitted,

C. W. CORNELL,
District Engineer.

BRANT

Brant County assumed a system of County Roads in January, 1917, at that time designating 105 miles of their main highways, or 18.2 per cent. of the total road mileage.

At the present time the system consists of 62 miles of County Roads, 27 miles of Provincial County Roads, 12.75 miles of Suburban Roads, or a total of 101.75 miles.

The work on the Brantford Suburban Roads of the past year consisted of constructing a concrete pavement 18 feet wide and 0.40 miles long, at a total cost of \$17,325.59, including ditching and grading. Grading to the extent of .75 miles was also completed on the Brantford Suburban Roads.

The work on Provincial County Roads consisted of one mile of grading and one mile of macadam road through the Village of St. George. The only other construction work undertaken, with the exception of some small sections graded, was a 20-foot reinforced concrete bridge erected on County Road No. 14.

A good system of maintenance has been carried on throughout the entire system.

The County purchased new machinery to the extent of approximately \$12,000.00, the principle item being one 3½-ton truck with trailer.

BRUCE

Bruce County adopted a County Road System in June, 1917, designating at that time 350 miles of the leading roads in the County, or about 15.8 per cent. of the total road mileage in the County.

The County System at present consists of 209 miles of County Roads, 129 miles of Provincial County Roads, or a total of 338 miles. During the year 38 miles of roads were assumed by the Province as Provincial Highways.

The work of the past year on Provincial County Roads consisted chiefly of the completion of the eight miles of crushed gravel road between Kincardine and Tiverton. This was completed at a total cost of \$71,560.01. The bridges on this road costing in addition to the above, \$14,998.82. The only other construction work of importance on Provincial County Roads was 1.75 miles of crushed gravel road on Provincial County Road No. 67.

The work on County Roads for the most part took the form of maintenance. A number of small reinforced concrete bridges were constructed throughout the County, the largest of which was a reinforced concrete bridge of 84-foot span built on Provincial County Road No. 67.

The County purchased approximately \$20,000.00 worth of new machinery during the year, the chief items of which were three rock crushers.

The road superintendent of Bruce acts under the direction of a committee of three. A very commendable feature of this committee is its permanent character, as it holds office during the pleasure of the County Council, and does not necessarily consist of members of the County Council.

CARLETON

Carleton County adopted a County Road System in 1909. The original system has been extended from time to time, at present it comprises 248 miles of County Roads, 22 miles of Provincial County Roads, and 20 miles of Suburban Roads, or a total of 290 miles, which is 18.5 per cent. of the total road mileage in the County.

The County accomplished a large program of construction, as well as maintenance and repair, during the past season. In all some \$616,033.72 was spent on the work during the year.

The work on the Suburban Roads adjacent to the City of Ottawa consisted of the construction of 2.69 miles of two-course asphaltic concrete pavement, built at a total cost, including culverts, of \$81,181.89, and 7 miles of waterbound macadam roadway. A 15-foot span reinforced concrete bridge was also constructed on the Suburban Roads.

The greater part of the work on Provincial County Roads took the form of maintenance and repair, some \$12,391.17, being spent in that respect. In addition 2,000 lin. ft. of gravel road was constructed on Provincial County Road No. 88, while approximately 20 miles of gravel roads, and 3 miles of stone road were constructed on County Roads. Numerous pipe and tile culverts were laid and several small concrete culverts built.

Several substantial bridges were built throughout the County during the season, ranging in span from 14 ft. to 90 ft. The chief of these was a 90-foot span reinforced concrete and steel structure, erected between Lots 10 and 11, Concession 7, Township of Fitzroy. A 105-foot span bridge was also erected at Burritts Rapids, the sub-structure of this bridge was reinforced concrete, and the superstructure steel. The cost of this bridge is being borne equally by the County of Carleton and the United Counties of Leeds and Grenville.

Considerable road building equipment was purchased during the year. The Suburban Commission purchasing a road roller, tractor, stone crusher, and an oil distributor, as well as considerable equipment of lesser value, while the County purchased new machinery to the extent of \$27,638.33, the main items of which were three road rollers, motor truck, and a concrete mixer.

DUFFERIN

The County of Dufferin adopted a County Road System in December, 1917. The total mileage designated at that time being 179 miles, or approximately 16.7 per cent. of the total road mileage of the County. The system as it now stands consists of 212 miles of County Roads. The Provincial Highway taking the place of what was originally a Provincial County Road.

The work of the past year consisted chiefly of maintenance and repair, some \$5,500.00 being spent in this respect. The small amount of road construction undertaken consisted for the most part of grading and metalling, with either crushed stone or crushed gravel. All told, some 2 miles of road was constructed.

The County constructed a number of reinforced concrete bridges, ranging in span from 10 feet to 50 feet. The most important of which was the Bourne Bridge, a reinforced concrete through girder structure, erected on Road No. 25, at a total cost of \$5,368.18.

GREY

The County of Grey assumed a County Road System in 1917. The main highways throughout the County being incorporated in the System. At the present time the County has under its jurisdiction 294 miles of County Roads, 62 miles of Provincial County Roads, and 30 miles of Suburban Roads. In addition to the above, 65 miles of Provincial Highways have been assumed within the County, taking the place of what was originally Provincial County Roads.

Very little work other than organization and maintenance and repair was attempted until the year 1919, when the County purchased considerable road building machinery, and thus were able to inaugurate an effective road building program.

The County has now four complete construction outfits at work. Two of these operated this year on the road between Owen Sound and Thornbury, while another operated south of Hanover, on Provincial County Road No. 65, and the fourth outfit was employed on County Road No. 29, the road passing through Ceylon and Flesherton. In addition to the above another outfit was employed on an extensive rock cut and hill reduction proposition east of Owen Sound, on Provincial County Road No. 14.

The road construction completed this year consisted of 5.25 miles of waterbound macadam on Provincial County Road No. 14, five miles of gravel on Provincial County Road No. 65, and two miles of waterbound macadam on County Road No. 29.

The County also constructed a number of reinforced concrete bridges, ranging in span from 10 to 80 feet. The more important of these was a 72-foot concrete arch bridge constructed on County Road No. 34, in the Village of Feversham, and an 80-foot concrete arch constructed on County Road No. 38, in the Village of Clarksburg. A system of maintenance has been carried out throughout the County by foremen appointed in each township to supervise all maintenance work within the township. These foremen have authority to engage such help as may be necessary from time to time, and are held responsible for the condition of the County Roads in their respective territories.

FRONTENAC

The County of Frontenac adopted a County Road System in 1907. The northern section of the County, however, was not included in the System. The System at present consists of 111 miles of County Roads, 38 miles of Provincial County Roads, and 42 miles of Suburban Roads, or a total of 191 miles, which is 23.9 per cent. of the total road mileage in area covered by the County Road System. The County now has 42 miles of Provincial Highway, 20 miles of which was originally a Provincial County Road.

The County is favorably situated with respect to road building material. The hauling costs can be reduced to a minimum, owing to the fact that limestone of good quality can be obtained at almost any point in the County.

Very little construction work was undertaken on Provincial County Roads. The work for the most part taking the form of maintenance and repair. The County Road work consisted of the construction of 4.75 miles of crushed stone road throughout the County. In addition, a number of pipe and tile culverts were constructed.

Two bridges were constructed, the Sydenham Bridge, an 18-foot span reinforced concrete structure, erected on Lot 3, Concessions 4 and 5, Township of Loughborough, and a 32-foot span reinforced concrete and steel bridge on the Suburban Roads, Lot 13, Concession 1, Township of Kingston.

The County purchased \$9,388.81 worth of new machinery during the year, the chief item of which was a new road roller.

LEEDS AND GRENVILLE

The United Counties of Leeds and Grenville assumed a County Road System in 1910. This has been extended from time to time. The present system consists of 402 miles of County Roads, and 6 miles of Suburban Roads, or 22.9% of the total road mileage in the County.

The work in this County during the past season consisted of the construction of six miles of crushed stone road on County Roads Nos. 7 and 7a, from Lot 6, Concession 10, to Lot 19, Concession 8, Township of Bastard, and four miles of similar road on County Road No. 45a, Lot 2, Concessions 2, 3 and 4, Augusta Township. Stone to the extent of 375.6 was piled for work to be done in the Suburban Roads of Smiths Falls. The greater part of the work, however, in this County, took the form of maintenance and repair, \$112,090.37 having been spent in this manner during the past season.

Two reinforced concrete and steel bridges were constructed during the year. Weir's Bridge, on County Road No. 51, opposite Lot 35, Concession 6, Township of Edwardsburg, was a 60-foot span, while Cochrane's Bridge, a similar structure of 62.5-foot span, was erected opposite Lot 10, Concession 8, Oxford Township. In addition to this the United Counties of Leeds and Grenville are paying half the cost of the Burritt's Rapids Bridge.

SIMCOE

The County of Simcoe adopted a County Road System in 1903, and from time to time the original system has been extended. At the present time the County Road System consists of 268 miles of County Roads, and 64 miles of Provincial County Roads, or 15.9% of the total road mileage in the County. The Provincial County Road mileage is 14.8% of the total road mileage under the jurisdiction of the County Council.

The construction work on the Provincial County Roads consisted of 4.5 miles of gravel road on the Penetang Road, opposite Lots 45 to 55, and Lots 60 to 70, also two miles of crushed stone road on Provincial County Road No. 63, between Penetang and Midland. In addition to the above, the concrete pavement on the Atherly Road in Orillia was completed. Some 20 pipe culverts were placed on Provincial County Roads.

The work on County Roads for the most part took the form of maintenance and repair, with the exception that a large number of pipe and tile culverts were laid; in all some 64 of these being placed during the year. Forty rods of crushed stone road was constructed on the townline of West Gwillimbury and Tecumseth.

Two reinforced concrete bridges of 12-foot span were constructed on Provincial County Road No. 20, at a total cost of \$3,204.41. A number of reinforced concrete bridges, ranging in span from 12 feet to 60 feet, were constructed on County Roads. The more important of these bridges was a 40-foot span reinforced concrete beam structure, erected

on County Road No. 15, opposite Lot 29, Concessions 6 and 7, Essa, and a 60-foot structure erected opposite Lot 8, Concessions 7 and 8, Tecumseth. The substructure of this bridge was reinforced concrete, while the superstructure was steel. Neither of these bridges were completed during year. New road building machinery was purchased this year to the extent of \$8,665.20; the main item being a roller and scarifier.

From the time the County adopted a County Road System until the year 1920, they operated on a township system; that is, all the money raised in a particular municipality for County Roads having to be spent on the County Roads in that particular municipality. This year, however, the County departed from this system, and is now operating on a strictly County basis. The results of this change will surely have a very marked effect in the continuous construction that is bound to follow such a move.

PERTH

The County of Perth adopted a County Road System in 1907. The original system has been extended from time to time. At present the County Council have under their jurisdiction 204 miles of County Roads, and 34 miles of Provincial County Roads. In all 23.8 miles, or 19% of the total road mileage of the County. The Provincial County Road mileage is 14.2% of the total road mileage under the jurisdiction of the County Council.

The work in Perth County in 1920 took the form, to a great extent, of maintenance and repair, some \$12,012.76 being spent in this manner on Provincial County Roads, and \$29,790.59 on County Roads. The construction on Provincial County roads took the form of tile draining. 7,644 lineal feet of tile ranging from 4 inches to 12 inches in diameter having been laid during the season.

The County Road work consisted of building one mile of broken stone and gravel road on County Road No. 5, opposite Lots 41 to 46, Township of Wallace, and also 1.25 miles of similar road on the townline of Logan Township and McKillop.

In addition to the above, 9,604 lineal feet of tile ranging from 4 to 10 inches in diameter, was laid on County Roads.

Only one bridge was constructed in the County during the year. This was a reinforced concrete structure 16-foot span, erected on Provincial County Road No. 46, at a cost of \$988.40.

New machinery to the extent of \$2,922.50 was purchased during the season, consisting of one large grader, one stone crusher, and one snow plow.

WATERLOO

The County of Waterloo assumed a County Road System in 1908. From time to time the original system has been extended. At the present time the system comprises 168 miles of County Roads, 21 miles of Provincial County Roads, and 16 miles of Suburban Roads, or a total of 205 miles, which is 24% of the total road mileage in the County. The Provincial County Road mileage is 10.2% of the total County Road mileage.

During 1920, 1.75 miles of concrete pavement was constructed on Provincial County Road No. 75, opposite Lots 18 to 36, in the Township of Woolwich. This completed a three-mile contract for pavement, which was let the previous year. In addition to the above, 1.75 miles of gravel road was constructed on Provincial County Road No. 76, in the Suburban area of Galt, opposite Lots 1 to 5, in the Township of Waterloo. The work on County Roads for the most part took the form of maintenance and repair, with the exception that a number of pipe and tile culverts, and small concrete culverts, were constructed.

A number of substantial reinforced concrete and steel bridges, ranging in span from 10 feet to 35 feet, were constructed throughout the County during the season. The more important of these was the Marten Bridge, a 35-foot span reinforced concrete structure, with steel girders erected on Provincial County Road No. 75, opposite Lots 18 and 19, Woolwich Township.

The County purchased \$10,585.00 worth of new machinery during the year, the chief items of which were a road roller, and scarifier.

The County at present is operating on the Township System, that is, all the money raised in any one municipality for County Road purposes, must be spent on the County roads within that particular municipality. However, with the progressive concrete road policy now being mapped out, it is to be hoped for the sake of continuous construction that the County will shortly discard the present system, and proceed on a strictly County basis.

WELLINGTON

The County of Wellington adopted a County Road System in 1903. It now has 244 miles of County Roads, 46 miles of Provincial County Roads, and 22 miles of Suburban Roads, or a total of 312 miles, which is 17.5% of the total road mileage in the County. The Provincial County Roads comprise 14.7% of the total road mileage under the jurisdiction of the County Council.

The work this year on Provincial County Roads and Suburban Roads took the form entirely of maintenance and repair, some \$29,055.11 being spent on the former, and \$9,295.11, on the latter in this respect. With the exception of a number of pipe and tile culverts and small concrete culverts constructed, the work on County Roads also took the form of maintenance and repair.

The usual grants were made to the several towns and villages within the County, the work in several of these places taking the form of bituminous macadam construction. A number of substantial reinforced concrete bridges, ranging in span from 10 feet to 45 feet, were constructed throughout the County during the season. The more important of these was the Campbell Bridge, erected between Lots 25 and 26, Concession 4, Minto, being a 35-foot span reinforced concrete truss, and the Honsinger Bridge, opposite Lot 14, Concessions 2 and 3, Peel, a 45-foot span, also a reinforced concrete truss.

The County purchased during the year some \$4,351.70 worth of new machinery, the chief item of which was a rock crusher. The rest consisted of graders and other smaller road maintenance equipment.

W. A. McLean, Esq.,
Deputy Minister of Highways,
Ontario.

Toronto, April 30th, 1921.

Sir:—

I have the honour to submit a brief report on the work performed during the year 1920 on the County roads of York, Peel, Halton, Wentworth, Lincoln, Welland and Haldimand.

The major portion of my time during the working season was occupied on bridge design for the Provincial Road System, and reviewing large numbers of bridge plans for County and Township roads.

Respectfully submitted,

ARTHUR SEDGWICK,

District Engineer.



The Construction of a New Bridge Permitted Improved Alignment.
The Kingston Road, east of Toronto.

HALDIMAND COUNTY

New construction in this County amounted to 28 miles of waterbound macadam 10 and 12 feet wide. The work was done by contract or by day labour. There were also 14.75 miles of road graded. The total expenditure amounted to \$223,640.35. Expenditure on maintenance and repair amounted to \$12,152.42, which consisted of re-surfacing from Hagersville to Nelles Corners, and dragging the earth roads.

Grants to the Villages of Caledonia, Jarvis and Cayuga, together with purchase and repair of machinery, and superintendence brought the total approved expenditure up to \$252,713.71.

Township Aid.

The Townships of Oneida and Seneca were the only Townships to avail themselves of the Provincial Aid of 20 per cent.

WENTWORTH COUNTY

On County Roads \$71,059.04 was expended on new construction. For this amount six and one-half miles of Macadam and three miles of gravel were built. Also a 45-foot concrete bridge with 24-foot roadway was built on Barton Street, at a cost of \$5,578.00.

There was \$65,121.65 spent on maintenance and repair, mostly for re-surfacing and bituminous surface treatment.

On Provincial County Roads, \$30,669.05 was expended for construction, of which sum \$2,500.00 has been spent to date on opening up Dundas Street through Lots 30 to 35 inclusive in Beverley Township including the construction of a 45-foot concrete bridge with 24-foot roadway and heavy cutting and filling. Expenditure for maintenance on Provincial County Roads amounted to \$8,519.74.

The total expenditure was \$191,278.92.

Township Aid.

With the exception of Ancaster and Glanford, all the Townships passed the necessary by-laws to participate in Provincial Aid of 20 per cent., and all except West Flamboro appointed Road Superintendents.

PEEL COUNTY

The County having been largely relieved of the burden of maintaining Dundas Street and the Centre Road, the expenditure this year was applied towards the maintenance and improvement of County roads. With an expenditure of \$52,439.31, ten miles of gravel and waterbound macadam were constructed, and seventeen miles of road were graded. There were \$32,885.30 spent for maintenance and repairs, mostly for gravel resurfacing. The Main Street of Streetsville was paved with bituminous macadam for a length of 6,033 feet at a cost of \$37,871.83, towards which the Province contributed 40 per cent. of the cost of the central 20 feet.

Township Aid.

The Townships of Albion and Toronto Gore passed the necessary by-law and participated in the Provincial Aid to the extent of 20 per cent. The latter appointed a Township Road Superintendent.

YORK COUNTY

The total approved expenditure in York County amounted to \$483,741.65. After providing some \$32,000.00 for bridge construction, exclusive of small culverts, \$44,000.00 for maintenance and repair, and \$8,000.00 for superintendence, machinery, etc. there remained \$399,464.29 for road construction, which consisted of seven and one-half miles of bituminous macadam, sixteen and one-half miles of macadam and gravel, and three and one-half miles of asphaltic concrete surfacing.

The bituminous macadam surfacing is on roads that have previously been constructed of waterbound macadam, it being the practice to first construct a waterbound macadam surface, and when the subgrade has thoroughly settled, to lay a bituminous surface.

In the outlying localities, gravel, where available, is used.

Two miles of asphaltic concrete surfacing was done on the Kingston Road east from the City of Toronto; also a mile and a third on the Weston Road north from Toronto. Six thousand lineal feet of asphaltic concrete on a concrete base was completed in the Town of Aurora, and six thousand lineal feet of bituminous macadam is being constructed in Newmarket.

Among others, concrete bridges at Islington and Unionville were constructed.

Township Aid.

The Townships of Markham and Etobicoke and Vaughan participated in Government Aid of Township Roads. Markham and Etobicoke appointing Superintendents.

HALTON COUNTY

Very little real road construction was done in this County during 1920. The total expenditure amounted to \$131,428.75, of which \$92,138.02 was expended on account of bridge construction. Of this latter amount \$75,898.13 was spent on the Dundas Street Bridge over Sixteen Mile Creek previous to Dundas Street being assumed by the Province. In addition, \$7,335.17 was required on account of the Bronte Bridge on the Toronto-Hamilton Highway, and \$3,087.69 for the completion of the Tansley Bridge on Dundas Street. A 30-foot concrete bridge was completed on the Oakville-Georgetown Provincial County Road, and work on a second bridge on the same road was started.

On the Oakville-Georgetown Provincial County Road, some three miles of grading and two miles of gravelling was done at a cost of \$14,650.00. There were \$18,000.00 expended for general maintenance and repair throughout the County Road System.

Township Aid.

The Township of Nelson and Nassagewaya appointed Road Superintendents and participated in Government Aid for construction and maintenance.

LINCOLN COUNTY

In this County there were constructed during the year 11.25 miles of waterbound macadam; 3 miles of gravel; 3.38 miles of tar macadam, and three-quarter miles of concrete pavement; with an additional 15.5 miles of grading. In general, the surfacing was 16 feet wide. The cost of this work, including a number of culverts constructed or lengthened, amounted to \$201,238.50. There were \$29,945.68 spent for ordinary maintenance and repair. There was also spent on bridges the sum of \$12,114.49.

Two motor trucks and one hoist were purchased during the year, which with the other smaller items amounted to \$20,299.47. The purchase price of all machinery and plant acquired since 1909, amounts to \$76,295.19.

The total expenditure for the year was \$277,854.61.

Township Aid.

With the exception of Grimsby, all the townships passed by-laws to participate in the Provincial Aid of 20 per cent., and all of these, except Niagara, appointed Road Superintendents.

WELLAND COUNTY

The expenditure on Provincial County and County roads for new construction amounted to \$110,077.75, for which 2.67 miles of macadam 16 feet wide; 2.58 miles of macadam 9 feet wide; 5 miles of bituminous macadam 16 feet wide, and a half-mile of concrete pavement in the Village of Ridgeway were built. A number of small culverts were replaced. In addition to the above \$93,194.13 was spent for maintenance and repair, mainly for extensive resurfacing.

The work has been done chiefly on Provincial County Road No. 69; on County Road No. 5, south from the Town of Thorold; Road No. 16 in Humberstone Township and in the Village of Ridgeway; resurfacing east of the Town of Welland; north and south of Fenwick; and north of Ridgeway.

Township Aid.

All the townships, with the exception of Wainfleet and Willoughby appointed road superintendents and passed the necessary by-law to participate in the Provincial Aid of 20 per cent.

**Easy Flowing Curves.**

Replace narrow, winding and dangerous locations on the Provincial Highway.

Report on Provincial Highways

By the CHIEF ENGINEER

W. A. McLean, Esq.,
Deputy Minister of Highways,
Ontario.

Toronto, January 30th, 1921.

Dear Sir:—

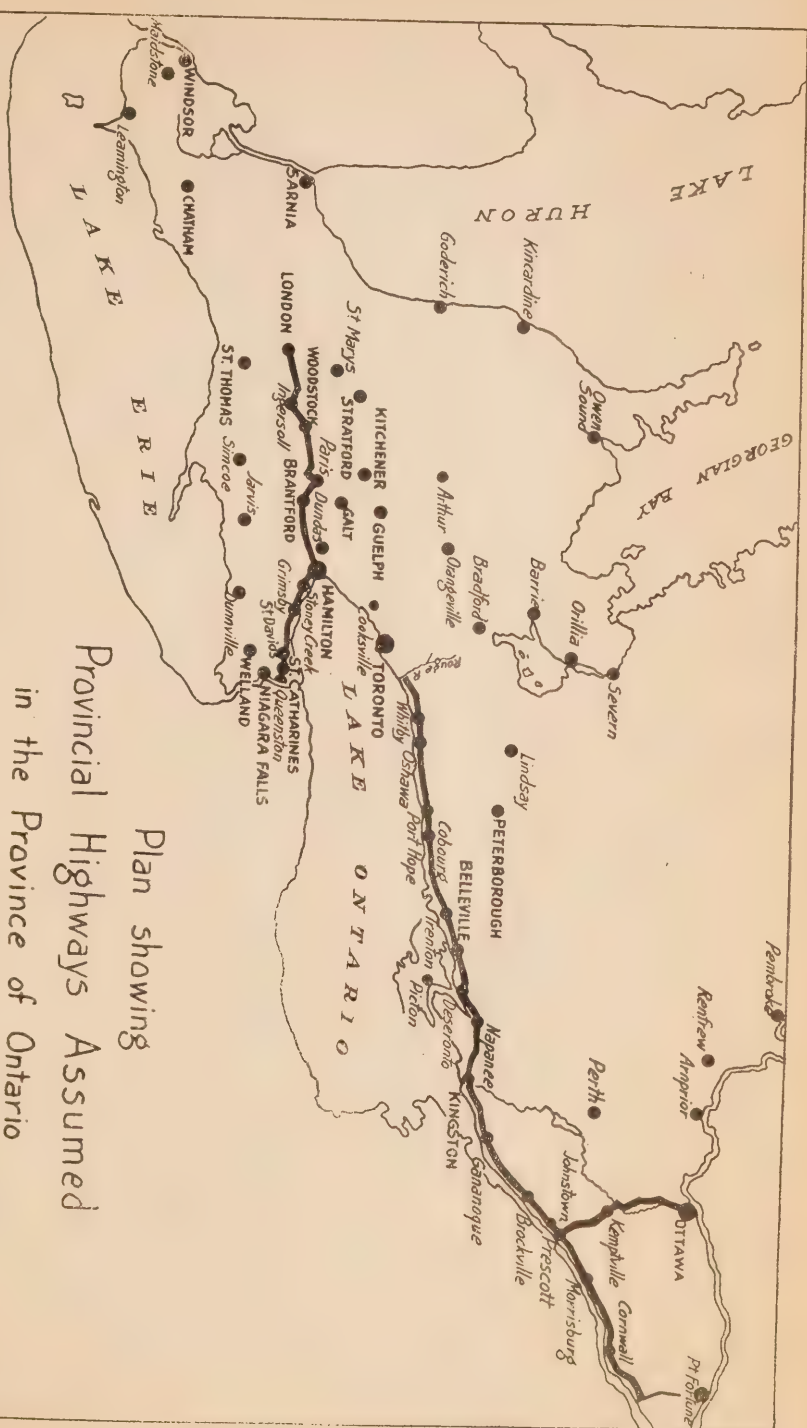
I have the honour to report upon the work of constructing and maintaining the Provincial Highway System in the Counties of Ontario for the year beginning December 1st, 1919, and ending November 30th, 1920.

The system of Provincial Highways on December 1st, 1919, comprised a total mileage of 426.98 located as shown on Map No. 1. During the year the system was extended by adding 1,177.15 miles, as shown on Map No. 2, and with these Highways linking up practically every city and county town in Southern Ontario, good road service could be given to all Townships, Counties and Cities within the entire area. A list of the roads added to the System, together with the mileage and date of designations is as follows:—

PROVINCIAL HIGHWAY ASSUMED IN 1920.

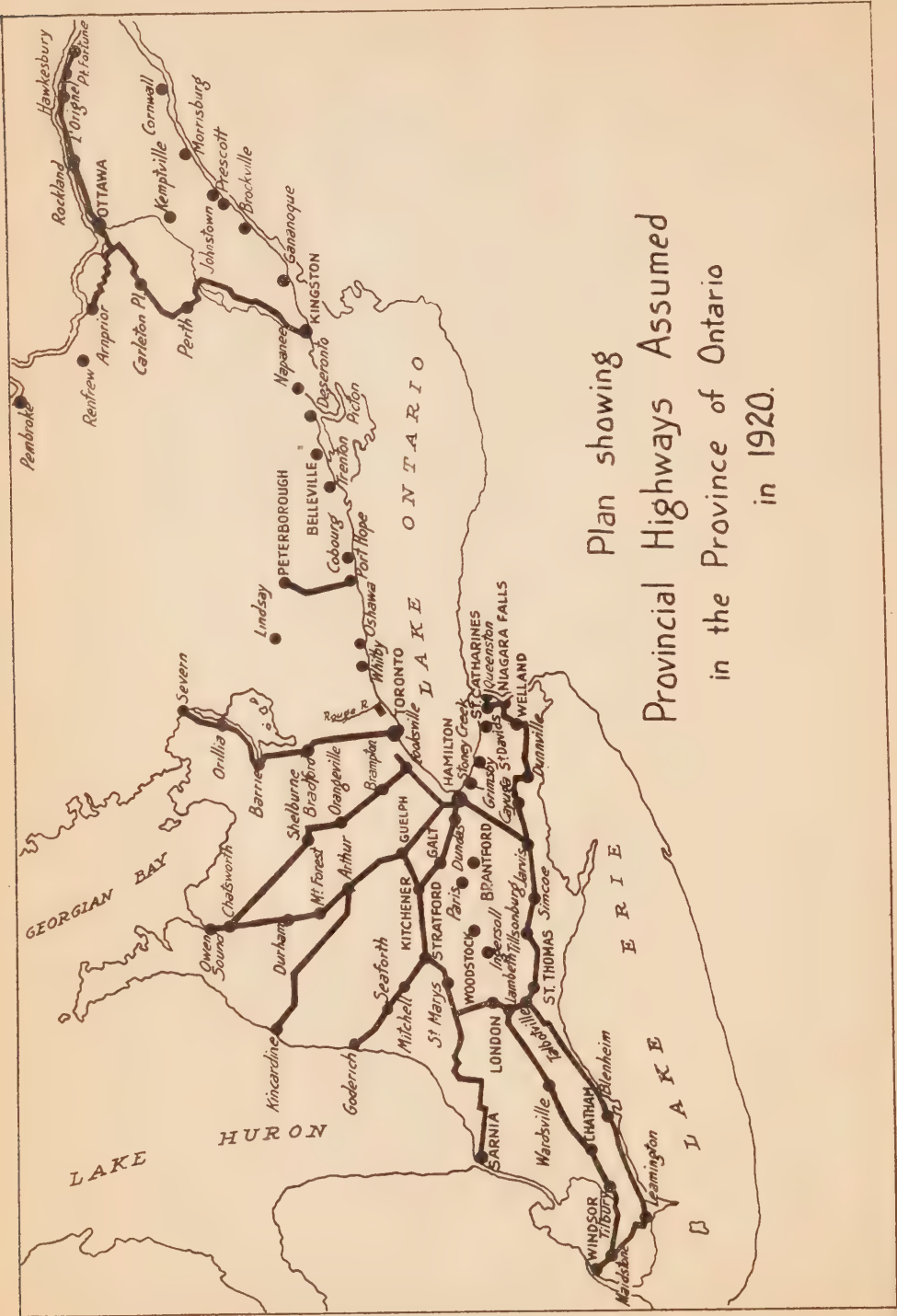
	Date of Designation	Municipality	Mileage	County Mileage
Bruce County	July 8th	Carriek Twp.	11.24	
	" "	Mildmay Village	.76	
	" "	Walkerton	.25	
	" "	Brant	4.28	
	" "	Kinloss	2.55	
	" "	Greenock	10.05	
	" "	Kincardine	9.04	38.17
Carleton	July 9th	Gloucester	7.07	
	October 6th	Nepean	18.85	63.80
	" "	Goulbourn	15.65	
	" "	Huntley	8.88	
	" "	Fitzroy	13.35	
Dufferin	July 8th	Melanchton	12.28	25.82
	" "	Amarath	.63	
	" "	Mulmur	.88	
	" "	Mono	12.03	
Durham & Northumberland	August 11th	Hope	4.87	18.94
	" "	Hamilton	6.67	
	" "	Monaghan South	2.58	
	" "	Cavan	4.82	
Elgin	August 4th	Yarmouth	7.35	58.39
	" "	Malahide	8.30	
	" "	Bayham	6.71	
	" "	Aldsbrough	10.77	
	" "	Dunwich	10.08	
	" "	Southwold	15.18	
Essex	June 24th	Sandwich West	4.11	59.71
	" "	Sandwich South	7.00	
	" "	Maidstone	2.63	
	" "	Gosfield North	6.41	
	" "	Gosfield South	6.80	
	" "	Mersea	8.53	
	August 4th	Sandwich South	.87	
	" "	Maidstone	8.09	
	" "	Rochester	6.15	
	" "	Tilbury West	6.29	
Grey	July 8th	Owen Sound City	.25	
	" "	Derby	2.65	
	" "	Sydenham	2.90	

Plan showing
Provincial Highways Assumed
in the Province of Ontario
in 1919.



	Date of Designation	Municipality	Mileage	Mileage
	" "	Bentnick	5.10	
	" "	Egremont	6.20	
	" "	Normanby	6.20	
	October 6th	Chatsworth	1.10	
	" "	Sullivan	5.66	
	" "	Holland	19.40	
	" "	Glenelg	6.57	
	" "	Artemesia	11.45	
	" "	Proton	3.38	
				70.86
Haldimand	June 24th	Walpole	13.93	
	" "	Jarvis	.82	
	" "	Rainham	1.01	
	" "	North Cayuga	11.30	
	" "	Cayuga	1.00	
	" "	Cansborough	8.15	
	" "	Dunville	1.10	
	" "	Moulton	5.95	
	" "	Oneida	7.90	
	" "	Seneca	2.65	
				53.81
Halton	July 31st	Trafalgar	9.35	
	" "	Nelson	6.15	
				15.50
Huron	July 8th	Howick	.80	
	" "	McKillop	3.59	
	" "	Tuckersmith	5.55	
	" "	Hullett	2.88	
	" "	Goderich	11.12	
	" "	Clinton	.14	
				24.08
Kent	July 2nd	Wheatley Village	.47	
	" "	Romney	13.00	
	" "	Tilbury East	3.40	
	" "	Raleigh	9.79	
	" "	Barwich	10.04	
	" "	Howard	6.71	
	" "	Orford	6.50	
	August 4th	Tilbury East	7.00	
	" "	Raleigh	8.47	
	" "	Chatham	9.21	
	" "	Camden	6.17	
	" "	Zone	7.59	
				88.35
Lambton	July 15th	Sarnia	7.90	
	" "	Plympton	11.43	
	" "	Warwick	14.45	
	" "	Bosanquet	6.70	
				40.48
Lanark	October 13th	Beckwith	6.50	
	" "	Ramsay	4.62	
	" "	Lanark	.84	
	" "	Drummond	15.45	
	" "	Elmsley North	6.25	
				33.66
Leeds	October 13th	Elmsley South	6.75	
	" "	Kitley	1.15	
	" "	Bastard	10.77	
	" "	Crosby South	10.68	
	" "	Leeds	6.68	
	" "	Gananoque	1.51	
				37.54
Lincoln	October 13th	Niagara	.85	
				.85
Middlesex	June 24th	Westminster	13.05	
	" "	London City	.25	
	July 2nd	Delaware	4.24	

	Date of Designation	Municipality	Mileage	Mileage
	" "	Caradoc	9.13	
	" "	Ekfrid	9.16	
	" "	Wardsville Village	.66	
	" "	Mosa	10.61	
	August 6th	London	18.36	
	" "	Biddulph	6.32	
	August 11th	Williams West	8.35	
	" "	Parkhill	.25	
	" "	Williams East	7.10	
	" "	McGillivray	4.00	
				91.48
Norfolk	August 4th	Middleton	11.90	
	" "	Windham	5.80	
	" "	Charlotteville	2.75	
	" "	Simcoe Town	.10	
	" "	Delhi	.33	
	" "	Townsend	4.40	
	" "	Woodhouse	4.75	
				30.03
Oxford	July 31st	Tilsonburg Town	.20	
	" "	Dereham	.64	
				.84
Peel	July 22nd	Toronto	17.82	
	" "	Chinguacousy	11.80	
	" "	Caledon	11.08	
				40.70
Perth	June 24th	Downie	2.59	
	" "	Ellice	3.90	
	" "	Fullarton	2.54	
	" "	Logan	4.33	
	" "	Hibbert	3.94	
	July 29th	Blanshard	7.01	
	" "	Downie	7.92	
	" "	Easthope North	5.70	
	" "	Easthope South	5.70	
				43.63
Peterborough	August 11th	Monaghan North	7.95	
	" "	Peterborough	.10	
				8.05
Prescott & Russell	August 4th	Cumberland	10.65	
	" "	Clarence	9.54	
	October 13th	Rockland	1.09	
	August 18th	North Plantagenet	13.81	
	" "	Alfred	7.14	
	" "	Longueuil	5.05	
	" "	L'Orignal	2.96	
	" "	Hawkesbury West	2.91	
	" "	Hawkesbury East	10.12	
				63.18
Simcoe	August 18th	Gwillinbury West	6.60	
	" "	Innisfil	12.16	
	" "	Barrie	.60	
	" "	Vespra	.80	
	" "	Oro	16.20	
	" "	Orillia	17.68	
				54.04
Waterloo	July 29th	Waterloo	10.70	
	" "	Wilmot	8.50	
	July 8th	Dumfries North	3.85	
	" "	Waterloo	7.00	
				30.05

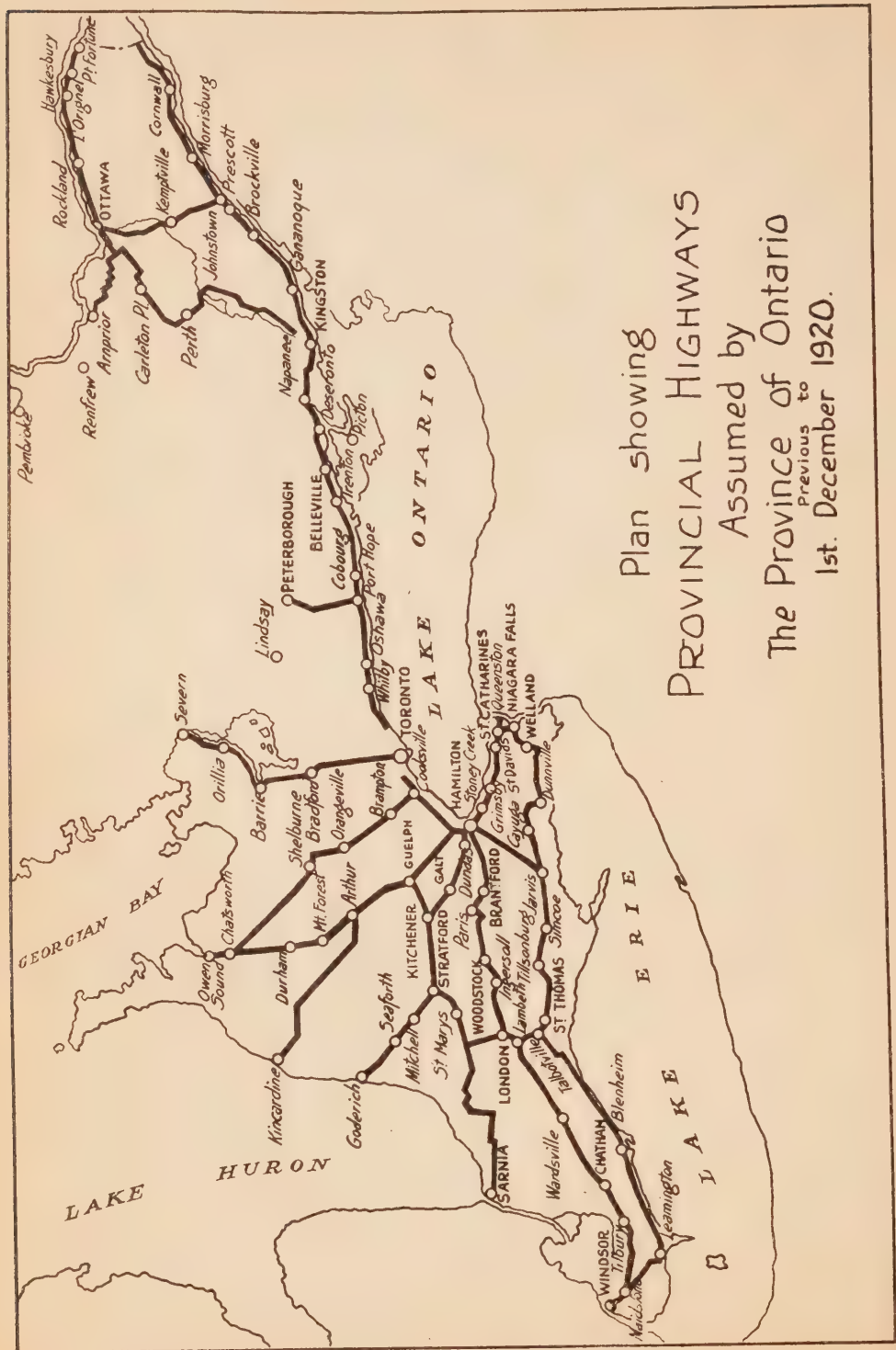


	Date of Designation	Municipality	Mileage	Mileage
Wellington	July 8th	Arthur	17.22	
	" "	Peel	8.09	
	" "	Maryborough	3.76	
	" "	Minto	12.12	
	" "	Clifford Village	1.00	
	July 15th	Nichol	11.73	
	" "	Guelph	5.85	
	" "	Puslinch	10.50	
	July 29th	Guelph	5.00	
	November 10th	Harriston	1.19	
	" "	Arthur	1.46	
				77.92
Wentworth	July 8th	Glanford	6.27	
	" "	Barton	3.13	
	" "	Flamboro West	10.45	
	" "	Flamboro East	7.27	
	" "	Ancaster	2.74	
	" "	Beverley	11.95	
	" "	Waterdown Village	.60	
				42.41
Welland	August 25th	Wainfleet	13.85	
	" "	Crowland	1.78	
	" "	Thorold	8.30	
	" "	Stamford	4.20	
	October 13th	Stamford	3.31	
	" "	Niagara Falls	.11	
				31.55
York	June 24th	York	4.45	
	" "	Markham	4.10	
	" "	Vaughan	4.10	
	" "	King	5.46	
	" "	Whitechurch	3.90	
	" "	Gwillinbury East	5.20	
	July 29th	Etobicoke	1.90	
	October 6th	Scarborough	4.20	
				33.31
TOTAL NO. MILES.....				1,177.15

The System of Provincial Highways, as on November 30th, 1920, and including all additions to the designated roads, is as shown on Map No. 3.

Proper supervision of the work of construction and maintenance of the roads designated required the appointment of additional staff composed of Resident Engineers and Assistants. As fast as the roads were designated, they were assigned in lengths of from eighty to one hundred or more miles, depending on circumstances, to the men placed in charge and headquarters were opened at towns and cities situated at convenient points on the various Highways. In this manner, immediate supervision of the roads was undertaken and the work of bringing up the general standard of road surface vigorously prosecuted.

From time to time, in the early months of the year, Conferences were held at which a program of work for the construction season was mapped out. Plans were matured for the improvement of sections requiring immediate attention and portions of the roads, which were notoriously bad and constituted breaks in the continuity of the System, were marked for improvement. To carry on the increased amount of work, additional earth moving equipment such as plows, drags, scrapers, wheel scrapers, graders and steam shovels, was advertised for, and contracts let for the supply of all necessary machinery early in spring season. Contracts for the supply of a quantity of crushed stone to be placed at various points were let early in the year, together with contracts for the building of culverts and bridges, the filling in of narrow roads across swamps, the grading of important and dangerous sections and the macadamizing of those portions requiring a new surface, so that when spring arrived, large gangs of men commenced work at a time when full advantage could be taken of the entire construction season. From the year 1914 till 1920, expenditures on roads had been almost entirely stopped while heavy traffic over the roads had greatly increased, and all surfaces were, as a result, in a deplorable condition. We were faced with the urgent necessity of having to quickly catch up with six years of neglect in order to protect the investment made in the roads as they



Plan showing
PROVINCIAL HIGHWAYS
Assumed by
The Province of Ontario
Previous to
1st. December 1920.

existed, and our early preparations were made with a view to giving close attention to the surface of the entire system so as to make travel safe, convenient and comfortable as soon as possible.

In many localities, the people had indicated their approval of the new width of Provincial Highway road allowance, eighty-six feet between fences, and options had been secured on much of the land to be added to the Highway to increase the width in accordance with the plan. Old fences placed on the limits of the original road allowance and in some cases encroaching on the original width, were in existence and to take full advantage of the new width so as to excavate ditches and construct the sub-grade, it was necessary that the old fences be moved. At points where all arrangements were completed, the fences were moved and in the entire season forty and one-half miles of fence had been set on the limits of the widened highway.

Many telephone, telegraph and power companies had lines of poles along the highways and the poles had been placed so as to avoid running the wires close to trees. This resulted in many poles being within the travelled portion of the road and dangerous to the public. Wherever grading operations were carried on, it was desirable to move all poles out of the way of the men and relocate the lines in the position allotted for such services. During the year, 57.3 miles of poles were moved to proper position on Provincial Highway Cross Section.

Old types of timber culvert construction were found everywhere on roads assumed and in many cases, decay had seriously reduced the strength of the structures, necessitating immediate renewal. Practically nowhere did we find culverts or other structures of adequate strength or permanency to justify leaving them in the new roadway and much rebuilding and replacement was necessary. Wherever the roadway was regraded, all structures were renewed so that the completed highway, after settlement had taken place, would require no further work to provide a secure foundation for a gravel roadway or macadam or other type of pavement. In all, 697 culverts and 16 bridges were built.

Construction was also commenced on three bridges to provide for the combined Toronto-Hamilton Highway, Guelph Road, Dundas Street and Waterdown Road entrance into the City of Hamilton. There will thus be provided into that city a splendid high level scenic roadway with no grades and only a few easy curves replacing three narrow roads which, at present, have very heavy dangerous grades, sharp turns and obscured vision, which makes the approach to Hamilton dreaded by many travellers.

On taking over Provincial Highways, examinations are made to determine which sections require specific work to be performed to make the road passable. Proper drainage of the roadway cannot be secured until the grading and ditching operations are completed and once a good earth subgrade properly drained is secured, a gravel road can be built with a minimum quantity of gravel. Without adequate ditches, the roads become flooded with water, rendering them impassable in spring and fall, while the same road with a good ditch, never becomes obstructed by water or dangerous ice conditions, and is passable at practically all ordinary seasons. The open side ditch is a wonderful aid to the road because it lowers the level of the ground water under the surface of the Highway and by drying up the ground, produces a hard surface upon which gravel, crushed stone, or a pavement can be safely placed. Almost everywhere, this drying up of the subgrade reduces the cost of roadbuilding by requiring small quantities of gravel or stone to produce a fine surface.

In all, two hundred and five and three-quarters miles of road were graded during the year.

Gravel is found very convenient to much of the Provincial Highway and a well drained and surfaced gravel road is economical and very satisfactory. Wherever traffic conditions are light enough to permit a gravel surface to be used, every effort is made to at once secure local gravel pits with which to maintain the highway. Experience has shown that a thin layer of new gravel spread two or three inches thick over the old road and carefully dragged produces a surface that is smooth and permits a large mileage to be built, and if small isolated sections require additional material, their requirements can be met and the fast progress maintained. Numerous gravel pits having an area of from one to five and more acres each and situated convenient to the highways were purchased during the year and enabled us to maintain 759.8 miles, and to build 195.2 miles of gravel road. The width of gravel spread was usually eight feet for single track maintenance and sixteen feet to twenty feet where grading operations were completed and full width could be obtained. From an examination of the Provincial Highways, it would seem possible that good gravel roads would provide, at small expenditure, an ideal surface for many years to come.

The Provincial Highways in many parts are located close to large deposits of rock, and in such cases, gravel is difficult to secure. Many sections of road close to cities carry



Heavy Stone Base on the Grimsby-St. Catharines Highway.

such heavy traffic that a stronger road than that produced by gravel is necessary. In such cases, quarries are secured, a crusher installed and crushed rock produced to build a macadam base course, or a finished macadam road, as the case requires. Where a road has had a new earth grade built, traffic must be carried during and after construction, but the earth in wet weather is useless as a road metal so that recourse must be had to travel or crushed stone to provide a surface that will carry vehicles. Settlement of earth embankments is always to be anticipated and it is folly to build a completed road on top of a new grade so that in certain sections, where traffic conditions will eventually require a strong road, preparations are made by completing the grading and then laying a base course of large crushed stone or field stone. This base course is built as smooth as possible so as to carry traffic and is placed for full pavement width of twenty or twenty-two feet, and a depth of five or six inches, so that in a few years when settlement has stopped and all soft spots in the road have been corrected, a final surface can be laid with the assurance that it will not fail due to defects in the subgrade. In all, 92.35 miles of macadam base were laid during the year.

In some localities, a finished macadam surface could be constructed because of the fact that the old road was of sufficient width and there was in place a proved foundation able to support a finished surface so that 24 miles of such surface was completed and thirteen and three-quarters of old macadam road maintained by application of crushed stone under careful maintenance methods.

Maintenance of macadam and gravel roads involved the application of thin coats of tar or oil, followed by spreading coarse sand or stone chips in order to bind and seal the surface, prevent dusty conditions and prevent automobiles tearing up the roads. This treatment was given to 175 miles of roads.

Macadam Penetration pavements, consisting of a properly graded surface of crushed stone into which hot tar or asphalt is forced under pressure, were constructed east of Beamsville for a distance of three and one-quarter miles, also 6.4 miles in Prescott and Russell Counties under contracts let by the County and taken over by the Department.

One contract for concrete pavement was let from the City of Brantford easterly and one and one-half miles were finished before work closed down. Work was greatly delayed due to shortage of cement.

One contract for Asphaltic Concrete surface was let westerly from Hamilton and the length of miles was completed well before cold weather set in.

Tabulation of work done by Counties with summary is as follows:

County	Miles of fencing moved.	Miles of poles moved.	Number of culverts built.	Number of brid- ges constructed.	Miles of grading.	Miles of graveling.	Miles of gravel maintenance.	Miles of macadam base laid.	Miles of macadam pavement.	Miles of bitumin- ous macadam.	Miles of asphaltic concrete.	Miles of concrete paving.	Clay Road maintained.
Lincoln	.....	.....	57	1	2.5	.....	.....	9.7	1.75	3.25	.....	.....	.....
Brant	.....	.....	38	.....	5	.....	9	2	.....	.....	.....	1.5	.....
Haldimand	.....	.....	23	.....	9.8	.....	.....	.....	4.5	.....	.....	.....	.....
Middlesex	.....	.....	7	1	.....	17	57	.....	.....	.....	.....	.....	.....
Elgin	.....	.....	.....	.....	.....	.....	58	.....	.....	.....	.....	.....	.....
Essex	.....	.....	.....	.....	.....	9.4	59.3	.....	.....	.....	.....	.....	.....
Norfolk	.....	.....	.....	.....	3	.....	30	.....	.....	.....	.....	.....	.....
Welland	1	.....	.....	.....	1	.....	.....	1	.....	.....	.....	.....	.....
Oxford	.....	1	14	1	7	14.8	26	.25	.....	.....	.....	.....	.....
Kent	.....	.....	.....	.....	5	13.7	88	.....	.....	.....	.....	.....	.....
Ontario	.....	8.6	19	1	10.7	1.0	.....	8	.....	.25	.....	.....	.....
Durham and Northumberland	10	12	92	4	34	50	80	.....	.....	.....	.....	.....	.....
Peterboro	.....	.....	.....	.....	5	.....	8	.....	.....	.....	.....	.....	.....
Hastings	2	.....	25	2	20	6.2	15	.....	4.2	.....	.....	.....	.....
Lennox and Addington	1	3.7	21	1	3.1	.....	.....	.....	5.6	.....	.....	.....	.....
Frontenac	5	44	.....	.....	4.6	.....	.....	5.4	7.7	.....	.....	.....	.....
Leeds and Grenville	17	2	165	2	34.3	10.2	28	19.3	.....	.....	.....	.....	.....
Stormont and Glengarry	2.5	.....	112	.....	14	2.5	2	18.7	.....	.....	.....	.....	.....
Carleton	3	.....	76	3	23	17.8	32	15.5	.....	.....	.....	.....	.....
Lanark	.....	.....	.....	.....	.....	3	.....	.....	.....	.....	.....	.....	.....
Prescott and Russell	.....	.....	.....	.....	.....	10.1	.....	3.5	.....	6.4	.....	.....	.....
Wentworth	.....	.....	.....	.....	.5	.....	37	3.75	4	.....	.5	.....	.....
Middlesex	.....	.....	.....	.....	6	1	10	.....	.....	.....	.....	.....	.....
Dufferin	.....	.....	.....	.....	.....	.....	9.5	.....	.....	.....	.....	.....	.....
Perth	.....	.....	.....	.....	1.75	2	7	1.5	.25	.....	.....	.....	.....
Waterloo	.....	.....	.....	.....	1.5	4	10	1.25	.....	.....	.....	.....	.....
Lambton	.....	.....	.....	.....	.....	3	10	.....	.....	.....	.....	.....	.....
Grey	.....	.....	.....	.....	2	11	58	.....	.....	.....	.....	.....	.....
Peel	.....	.....	.....	.....	.....	.....	29	.5	9.75	.....	.....	.....	.....
Halton	.....	.....	.....	.....	1	.....	4	.....	.....	.....	.....	.....	14.5
Wellington	.....	.....	.....	.....	.5	12	20	.....	.....	.....	.....	.....	.....
Huron	.....	.....	.....	.....	2	3	6	.....	.....	.....	.....	.....	.....
York	.....	.....	4	.....	6	.5	27	2	.....	.....	.....	.....	.....
Simcoe	.....	.....	.....	.....	2.5	3	30	.....	.....	.....	.....	.....	.....
Brace	.....	.....	.....	.....	.....	10	.....	.....	.....	.....	.....	.....	.....
Totals	41.5	71.3	653	16	205.75	195.2	759.8	92.35	37.75	9.90	.5	1.5	14.5

Bridges Completed		Span
Name		
Rouge		652" 0"
Pickering		120" 0"
Bowmanville		64" 0"
Wilmot Creek		40" 0"
Gages Creek		54" 0"
Massies Bridge		35" 0"
Grafton		38" 0"
Shannonville		80" 0"
Marysville		48" 0"
Sucker		44" 0"
Kaylers		50" 0"
Odessa		44" 0"
Aux Raisin		170" 0"
Johnstown Creek		26" 0"
Spencerville		72" 6"
North Gower		60" 0"
Carsonby		35" 0"
Mud Creek		37" 6"
Jack River		80" 0"
Red Hill		40" 0"
Thamesford		75" 0"
Dotey's Creek		80" 0"

Respectfully submitted,

GEO. HOGARTH,

Engineer of Highways.

Toronto, February 17th, 1921.

W. A. McLean, Esq.,
Deputy Minister of Highways,
Ontario.

Sir:—

I submit herewith a report of the principal operations undertaken by the Department of Forestry during the year 1920.

INSPECTION OF TREE GROWTH

The duty first undertaken by the Forester was to make a trip over the Provincial Highways upon which, at the time of his appointment, work had been started, or had been finished. This was done in order to ascertain the approximate percentage of existing tree growth and to determine localities to be planted with trees during the Fall.

It was found that no more than 25 per cent. of the total length of highways was lined by trees, and that some of this tree growth was unsatisfactory; the trees in many cases being too closely spaced, out of alignment, or the lines were too near the roadway for safety, or too near the location of the ditches to be preserved. Some of the avenues were however magnificent as were individual trees here and there.

PRUNING OF TREES

During the inspection of the trees, in company with the various Divisional and Resident Engineers, the matter of the preservation of the trees was discussed, and also the necessary work of pruning by the various telephone, telegraph and power companies. Satisfactory arrangements for the pruning and preservation of the trees were made. It was decided that only where construction operations rendered it imperative to remove a tree, that this should be done.

In regard to the pruning of trees the Forester, through the Superintendent or other officials of the companies concerned, got in touch with the various line foremen and instructed them in the pruning of trees during October. In some cases the Forester stayed until the work was finished. The various companies paid for the labour and the trees were, wherever possible, left in a symmetrical shape, or in such a shape as to be later symmetrically pruned by the Department.

In connection with the pruning of trees the Forester visited Prescott on October 5th, and on the 6th inspected trees as far as Morrisburg in company with Mr. Rayside, the Superintendent of Construction of the Bell Telephone Company, Eastern Division, Montreal. Arrangements were made whereby co-operation in the matter of pruning trees was established to the satisfaction of all parties.

On October 9th, co-operation between the Bell Telephone Company, on the Brantford and Hamilton Highway was effected, through Mr. Ross, of Hamilton. On October 15th, between Toronto and Newmarket, through Mr. Gardener, the Plant Chief, and on November 2nd, between St. Thomas and Dutton, through Mr. Heard, the Plant Chief. On September

15th, Mr. K. Wildern, Plant Chief, Bell Telephone Company, requested to be taken over the highway between St. Catharines and St. Davids, with a view to clearing the wires. This was done and arrangements were made for the Company to do the necessary pruning.

During October and November requests were received from the Hydro-Electric Power Commission to be allowed to prune trees at St. Davids on the Queenston-Hamilton Highway, and between Bullock's Corners and Christy's Corners on the Dundas-Galt Highway. Representatives of the Commission were met on the ground and satisfactory arrangements made. In the latter case one hundred trees were pruned, about 75 of these being 30 years to 75 years old.

During November the Great Northwestern Telegraph Company re-located their line between Hamilton and Binkley's Corner, in this case also the Company entered into co-operation and the necessary work was carried out to the satisfaction of all concerned.

In the course of the work which extended over many weeks, not a single unpleasant incident marred the harmony which existed between the Department and the Companies in question, each co-operated with the other with the desire to save the trees, which were cut with a minimum of injury.

The matter of the appointment of an expert tree pruner was discussed with the representatives of the forementioned companies—that is—a tree pruner for each company, a man who would be expert enough to satisfactorily supervise all pruning along their respective lines. From the kindly manner in which the suggestion was received it may be assumed that such an appointment will materialize sooner or later. Were such appointments effected by the Bell Telephone Company, or the Hydro-Electric Power Commission, tree lovers would certainly not raise the objection to necessary pruning being done, and what at present with many private owners of trees, is a disagreeable situation, would be materially relieved. For this co-operation Mr. Hugill, of the Hydro-Electric Commission; Mr. Duckworth, of the G.N.W. Telegraph Company, and Messrs. Rayside, Ross, Leitch, Gardner and Wildern, of the Bell Telephone Company, are to be thanked.



Rowe's Hill Before Improvement.

LAYING OUT PARKS

A study was made of various areas at intersections of roadways with a view to their beautification, and with this object in view various plans are now in course of preparation. In the case of the area at the intersection of the Provincial Highway to Port Hope and the Road to Canton, and known as Welcome Corner, a plan was prepared and the area planted as a park.

At the intersection of the Provincial Highway and Burnham Street at Cobourg, a small area was ploughed in readiness to be planted in Spring, a plan of this is now finished.

Pleasant incidents have marked the progress of the work of beautification. Residents of the municipalities in which the work has been done have asked to be allowed to donate beds of flowers and have promised to maintain the areas. This in itself is a source of the greatest satisfaction.



Rowe's Hill Widened and With Adequate Drainage.

PLANTING TREES ALONG THE HIGHWAYS

During the fall and early winter months, tree planting was commenced on the Kingston Road between Newcastle and Port Hope. Approximately thirteen miles were planted comprising two and three-quarter miles in Pickering Township, from the Rouge Bridge easterly to Pickering. Eight and one-half miles in Clarke Township, from a point one mile west of Newcastle and extending easterly through Newtonville, one and three-quarter miles in Hope Township, beginning a short distance west of Welcome Corner to Port Hope. The total number of trees planted was 1,832,—1,400 Hard or Sugar Maples, 418 White Elms and 14 White Ashes. The first tree was planted on October 22nd, in Clarke Township. This tree should have historic worth as time goes on.

In the various low lying areas which through bad drainage were suited only for the growth of such trees as Elms and Ashes, these were planted thus ensuring avenues which will remain unbroken, where otherwise losses might have occurred. Through the swamp land, west of Newtonville, Elms were planted, the avenue extending three-quarters of a mile.

REMOVING SIGNS FROM TREES

Work of a very important nature was that of removing the signs from the trees. In many cases considerable injury had been effected by people driving nails into valuable trees to support signs along the highways. This was, however, not the only drawback, for it was found upon the removal of these signs that they harboured insect pests, such as the Tussock and other moths, as their nests could be hidden from the light. In one case over one hundred of these pests were discovered between a single sign and the trunk of a tree. It required but little explanation to satisfy the owners of the signs that the practice of nailing these to the trees was wrong and many of them graciously promised to desist from the practice.

INSPECTING GRAVEL PIT AND QUARRY AREAS

During the summer at various times the Highway Forester visited some of the gravel pit and quarry areas with a view to ascertaining their suitability for reafforestation, or for the growing of trees for roadside planting. It was found that the old C.P.R. gravel pit at Newtonville offers a splendid chance for reforestation with some of the pines. This large area, about thirty acres, being located right along the Provincial Highway, and as its entire area may be seen by tourists, it would appear that no finer spot exists for the purpose in question. A large portion of the area from which the gravel has not been taken is a light sandy loam, this about ten acres in extent touches the highway. The remainder, about twenty acres, from which much gravel has been taken is composed of gravel sand, and some loam. Upon this the growth of pines would perhaps be slow, but it is almost certain they would grow to a commercial size.

In conversation with Mr. E. J. Zavits, the Provincial Forester, this gentleman promised to assist your Department and offered to supply 5,000 pine seedlings, during the spring of 1921. In subsequent years considerably larger numbers would be given for re-afforestation purposes. This spirit of co-operation will in the future mean much and will enable your Department to quickly cover with tree growth, and to put to profitable use the areas under its control, areas which would otherwise appear barren and worthless.

The Department quarry area at Hamilton, comprising about eighty acres, was also inspected. This area offers facilities either as a reafforestation project or for nursery purposes. Upon it trees and shrubs for highway beautification could be grown. This nursery would largely serve the Western Division, and in conjunction with a Northern and Eastern nursery suitably located, would adequately meet the needs of the Department.

CO-OPERATION OF PUBLIC BODIES

During the year members of many Municipal Councils, Chambers of Commerce and Horticultural Societies expressed a desire to help with the work of Highway Beautification. Several individuals promised to cut the grass and weeds in front of their property and to try and induce others to do so, and so help to maintain a state of neatness along the Highways.

The Sarnia Chamber of Commerce placed itself on record as being the first organization to offer to co-operate with your Department, and its services are at your disposal in all matters pertaining to the beautification of the approaches to the city. Organizations in St. Catharines, St. Thomas and other towns and cities have likewise promised to support the work.

Respectfully submitted,

H. J. MOORE,
Forester.

Motor Vehicles Branch

Report of Registrar of Motor Vehicles.

W. A. McLean, Esq.,
Deputy Minister of Highways,
Ontario.

Sir,—I have the honour to submit the following statistics of the permits and licenses issued by the Motor Vehicles Branch during the year 1920.

These statistics show in detail the number of passenger cars, commercial vehicles, motorcycles and chauffeurs located in each City and County, as well as the occupations of the owners and the horse-power, carrying capacity and other descriptions of the vehicles registered.

Respectfully submitted,

J. P. BICKELL,
Registrar of Motor Vehicles.

PASSENGER CARS IN ONTARIO IN 1920

Counties.		Cities.		Total.
Algoma	568	Sault Ste. Marie	939	1,507
Brant	1,455	Brantford	1,279	2,734
Bruce	3,030	.....	.....	3,030
Carleton	1,402	Ottawa	3,267	4,669
Dufferin	1,452	.....	.....	1,452
Dundas	1,166	.....	.....	1,166
Durham	1,391	.....	.....	1,391
Elgin	2,555	St. Thomas	963	3,518
Essex	5,134	Windsor	2,614	7,748
Frontenac	1,146	Kingston	1,004	2,150
Glengarry	530	.....	.....	530
Grenville	672	.....	.....	672
Grey	2,899	Owen Sound	630	3,529
Haldimand	2,050	.....	.....	2,050
Haliburton	119	.....	.....	119
Halton	1,689	.....	.....	1,689
Hastings	3,039	Belleville	668	3,707
Huron	3,429	.....	.....	3,429
Kenora	55	.....	.....	55
Kent	4,966	Chatham	1,220	6,186
Lambton	3,037	Sarnia	803	3,840
Lanark	1,519	.....	.....	1,519
Leeds	2,229	.....	.....	2,229
Lennox and Addington	1,342	.....	.....	1,342
Lincoln	1,623	St. Catharines	973	2,596
Manitoulin	426	.....	.....	426
Middlesex	3,937	London	3,049	6,986
Muskoka	455	.....	.....	455
Nipissing	579	.....	.....	579
Norfolk	2,068	.....	.....	2,068
Northumberland	1,990	.....	.....	1,990
Ontario	3,035	.....	.....	3,035
Oxford	2,973	Woodstock	490	3,463
Parry Sound	503	.....	.....	503
Peel	1,845	.....	.....	1,845
Perth	2,579	Stratford	783	3,362
Peterboro	1,227	Peterboro	949	2,176
Prescott	712	.....	.....	712
Prince Edward	1,370	.....	.....	1,370
Rainy River	356	.....	.....	356
Renfrew	1,652	.....	.....	1,652
Russell	455	.....	.....	455
Simcoe	4,464	.....	.....	4,464
Stormont	1,281	.....	.....	1,281
Sudbury	803	.....	.....	803
Thunder Bay	158	Fort William	663	821
.....	.....	Port Arthur	519	519
.....	.....	.....	.....	360
Temiskaming	360	.....	.....	1,949
Victoria	1,949	Kitchener	1,142	3,715
Waterloo	2,373	Galt	734	734
.....	.....	Welland	656	3,019
Welland	2,563	Niagara Falls	1,095	1,095
.....	.....	Guelph	817	3,225
Wellington	2,408	Hamilton	5,771	7,991
Wentworth	2,220	Toronto	26,798	31,253
York	4,455	.....	.....	342
Foreign .....	.....	.....	.....	.....

155,861

OCCUPATIONS OF OWNERS

Passenger Cars

Farmers	57,429
Business	16,741
Tradesmen	21,389
Professional	5,894
Manufacturers	4,215
Doctors	4,011
Firms	1,872
Liverymen	3,879
Commercial Travellers	3,760
Agents	4,497
Real Estate Agents	1,094
Insurance Agents	1,074
Contractors	2,486
Undertakers	335
Laborers	2,344
Managers and Foremen	6,539
Police	219
Drovers	596
Unclassified	7,512
Unoccupied	8,907
Municipal Corporations, etc.	394
Private Corporations, etc.	163
Soldiers	145
Dominion Government	51
Ontario Government	178
Royal Air Force	3
Military Units	2
Munitions Board	2
D.S.C.R.	97
Department of Militia and Defence ..	30
Military Hospitals	3
	<hr/> 155,861

HORSEPOWERS

Passenger Cars

Fords, 22.5	70,896
15	192
16-20	21,899
21-25	39,781
26-30	18,569
31-35	2,367
36-40	1,401
41-45	386
46-50	216
51-up	25
Electric	129
	<hr/> 155,861

COMMERCIAL VEHICLES IN ONTARIO IN 1920

Counties.		Cities.		Total.
Algoma	35	Sault Ste. Marie	109	144
Brant	85	Brantford	237	322
Bruce	78			78
Carleton	58	Ottawa	639	697
Dufferin	27			27
Dundas	30			30
Durham	42			42
Elgin	12	St. Thomas	106	118
Essex	449	Windsor	518	967
Frontenac	50	Kingston	123	173
Glengarry	5			5
Grenville	35			35
Grey	122	Owen Sound	5	127
Haldimand	69			69
Haliburton	2			2
Halton	169			169
Hastings	96	Belleville	96	192
Huron	106			106
Kenora	15			15
Kent	120	Chatham	151	271
Lambton	122	Sarnia	97	219
Lanark	23			23
Leeds	100			100
Lennox and Addington	56			56
Lincoln	244	St. Catharines	250	494
Manitoulin	5			5
Middlesex	152	London	520	672
Muskoka	21			21
Nipissing	45			45
Norfolk	77			77
Northumberland	99			99
Ontario	200			200
Oxford	122	Woodstock	76	198
Parry Sound	18			18
Peel	137			137
Perth	88	Stratford	73	161
Peterboro	56	Peterboro	115	171
Prescott	30			30
Prince Edward	64			64
Rainy River	20			20
Renfrew	66			66
Russell	14			14
Simcoe	191			191
Stormont	39			39
Sudbury	72			72
Thunder Bay	19	Fort William	137	156
		Port Arthur	69	69
Temiskaming	56			56
Victoria	86			86
Waterloo	141	Kitchener	173	314
		Galt	90	90
Welland	215	Welland	96	311
		Niagara Falls	164	164
Wellington	62	Guelph	114	176
Wentworth	281	Hamilton	943	1,224
York	670	Toronto	5,536	6,206
Foreign				571
				16,204

OCCUPATIONS

Farmers	1,273
Business	3,188
Tradesmen	636
Professional	51
Manufacturers	547
Doctors	35
Firms	6,243
Liverymen	274
Commercial Travellers	37
Agents	122
Real Estate Agents	13
Insurance Agents	9
Contractors	2,104
Undertakers	223
Labourers	76
Managers and Foremen	79
Police	16
Drovers	14
Unclassified	264
Unoccupied	155
Municipal Corporations, etc.	314
Private Corporations, etc.	281
Soldiers	1
Dominion Government	43
Ontario Government	122
Royal Air Force	1
Military Units	1
Munition Board	.....
D.S.C.R.	21
Department Militia and Defence	61
Military Hospital	.....
	16,204

TONNAGE OF COMMERCIAL VEHICLES

1½	5,313	
1	8,163	
1½	895	
2	884	
2½	155	
3	209	
3½	294	
4	59	
4½	12	
5	196	
5½	7	
6	6	
6½	7	
7	3	
up	1	
		16,204
Gasoline	16,158	
Electric	45	
Steam	1	
		16,204
Original	5,139	
Renewal	11,065	
		16,204
Delivery	3,514	
Trucks	12,298	
Ambulance	86	
Hearse	198	
Casket Wagons	26	
Patrols	13	
Fire Apparatus	69	
		16,204

MOTORCYCLES

Counties.		Cities.		Total.
Algoma	5	Sault Ste. Marie	64	69
Brant	29	Brantford	50	79
Bruce	16			16
Carleton	38	Ottawa	186	224
Dufferin	11			11
Dundas	6			6
Durham	19			19
Elgin	12	St. Thomas	24	36
Essex	72	Windsor	63	135
Frontenac	9	Kingston	42	51
Glengarry	2			2
Grenville	5			5
Grey	31	Owen Sound	13	44
Haldimand	14			14
Haliburton	1			1
Halton	35			35
Hastings	13	Belleville	21	34
Huron	35			35
Kenora	3			3
Kent	29	Chatham	27	56
Lambton	29	Sarnia	20	49
Lanark	14			14
Leeds	26			26
Lennox and Addington	11			11
Lincoln	44	St. Catharines	40	84
Manitoulin	1			1
Middlesex	55	London	145	200
Muskoka	5			5
Nipissing	10			10
Norfolk	25			25
Northumberland	18			18
Ontario	75			75
Oxford	52	Woodstock	18	70
Parry Sound	4			4
Peel	41			41
Perth	33	Stratford	54	87
Peterboro	9	Peterboro	29	38
Prescott	4			4
Prince Edward	23			23
Rainy River	11			11
Renfrew	30			30
Russell	4			4
Simcoe	64			64
Stormont	11			11
Sudbury	13			13
Thunder Bay	3	Fort William	29	32
		Port Arthur	26	26
Temiskaming	25			25
Victoria	19			19
Waterloo	70	Kitchener	65	135
		Galt	46	46
Welland	81	Niagara Falls	55	55
		Welland	50	131
Wellington	25	Guelph	33	58
Wentworth	62	Hamilton	290	352
York	289	Toronto	2,532	2,821
Foreign				3

5,496

CHAUFFEURS

Counties.		Cities.		Total.
Algoma	101	Sault Ste. Marie	261	362
Brant	68	Brantford	206	274
Bruce	131			131
Carleton	83	Ottawa	749	832
Dufferin	28			28
Dundas	41			41
Durham	96			96
Elgin	46	St. Thomas	151	197
Essex	261	Windsor	582	843
Frontenac	45	Kingston	148	193
Glengarry	28			28
Grenville	54			54
Grey	164	Owen Sound	144	308
Haldimand	66			66
Haliburton	15			15
Halton	93			93
Hastings	211	Belleville	137	348
Huron	265			265
Kenora	12			12
Kent	158	Chatham	190	348
Lambton	82	Sarnia	119	201
Lanark	121			121
Leeds	195			195
Lennox and Addington	99			99
Lincoln	68	St. Catharines	260	328
Manitoulin	55			55
Middlesex	96	London	707	803
Muskoka	70			70
Nipissing	98			98
Norfolk	57			57
Northumberland	232			232
Ontario	272			272
Oxford	177	Woodstock	92	269
Parry Sound	62			62
Peel	37			37
Perth	101	Stratford	77	178
Peterboro	67	Peterboro	161	228
Prescott	49			49
Prince Edward	84			84
Rainy River	55			55
Renfrew	70			70
Russell	8			8
Simcoe	345			345
Stormont	65			65
Sudbury	143			143
Thunder Bay	1	Fort William	112	113
		Port Arthur	69	69
Temiskaming	99			99
Victoria	140			140
Waterloo	105	Kitchener	145	250
		Galt	90	90
Welland	249	Welland	142	391
		Niagara Falls	224	224
Wellington	56	Guelph	102	158
Wentworth	79	Hamilton	1,393	1,472
York	346	Toronto	7,472	7,818
Foreign				81

19,563

APPENDIX

EXPENDITURE ON CONSTRUCTION

(Exclusive of Provincial)

The following Schedule shows in detail the work and approved expenditure on construction

County	Work Done During Year.							Roads and Culverts
	Graded Miles	Miles Stoned	Miles Gravelled	Tile Drain	Revs.	Dredges	Pipe and Tile Culverts	
Brant	1.					17		\$6,056.38
Bruce	1.					21	2	9,016.71
		Asp. Con. 2.69						
Carleton	13.25	10.83	21.05	626.	4	86	14	301,258.97
Dufferin		.80	1.0	12.12	9	115	4	22,203.65
Elgin	.09	1.62	.9	36.3	2	52	4	30,442.38
Essex	.31	3.75	7.50	181.81	2	7	5	175,602.12
Frontenac		2.00			2	27	2	38,047.59
Grey	1.	4.75			8	4	24	36,466.26
Haldimand	14.75	21.25	6.75			49		223,640.35
Halton	3.				1	6	2	1,626.95
Hastings			6.50		7		3	29,312.68
Huron	1.25				2	12	8	48,612.80
Kent		.80	1.84	771.	3	18	1	7,980.09
Lambton		.09	.25	1,240.	2	38		59,732.30
Linark		12.50	.05	60.6	2	10	1	34,885.38
Leeds and Grenville.		10.05	1.			3		4,413.13
Lennox and Addington	.50							
		Bit. Mac. 3.38						
Lincoln	15.50	.75	3.		3	134	22	204,468.41
		11.25						
Middlesex	11.50		9.75	784.36	1	27		32,005.12
Norfolk	4.07		1.49	14.96	2	26	2	41,103.81
Northumberland and Durham			8.12		1	7		10,348.10
Ontario	.45	.31	.06	44.	9	52	9	15,837.34
Oxford	1.50		17.19	6,977.		15		50,056.52
		Bit. Mac. 1.14						
Peel	16.86	2.12	8.03	109.10		39	4	81,904.44
Perth			2.25	582.		8	1	15,012.95
Peterboro						1	3	4,039.44
		Bit. Mac. 7.58						
Prescott and Russell.	27.2	12.10	1.87		7	88	8	317,589.18
Prince Edward	1.75	5.			2	37	2	40,029.89
Renfrew		2.50	1.		6	7	1	44,062.90
Simcoe		.18			6	64	6	10,652.83
Stormont, Dundas and Glengarry	25.	27.50	.2		1		5	254,854.32
Victoria	4.87	5.12		7.93	3	39	5	24,226.18
Waterloo		Bit. Mac. .22			4	6	13	4,074.44
		Con. .50						
Welland	1.12	Bit. Mac. 2.30		105.		22	12	78,128.16
		2.58						
		Bit. Mac. 1.60						
Wellington	.3	.30	.7	32.		14	8	8,247.71
Wentworth	8.	6.50	3.	78.78	1	12	4	64,237.04
		Bit. Mac. 4.26						
York		Asp. Con. 1.40	8.18		5	35	23	292,848.11
		8.40						
Totals	154.27	* 178.12	111.68	13,144.00	93	1,098	198	2,623,024.63

* Includes:—

147.75 W. B. Macadam
 20.48 Bituminous Macadam.
 5.80 Concrete.
 4.09 Asphaltic Concrete.

No. 1

OF COUNTY ROADS

(County Roads)

on County Roads during 1920 upon which Provincial Subsidies were paid during 1921.

Approved Expenditure for Year

Bridges	Machinery and Repairs	Special Grants to Towns and Villages	Purchase of Toll Roads and Gravel Pits	Superintendence	Total Approved Expenditure on Construction	Approved Total Expenditure on Maintenance	Approved Expenditure on Government Grant	40 per cent Disallowed	Total
\$2,799.95	\$31,419.37			\$4,087.28	\$44,362.98	\$24,497.41	\$68,860.39	\$27,544.16	\$10.00
10,337.87	20,847.68	\$1,640.62		3,899.09	45,781.97	27,339.69	73,121.66	29,248.66	
95,950.55	54,059.66			6,840.27	458,109.45	69,173.43	527,282.88	210,913.15	225.00
15,251.99	3,962.98			2,078.47	43,497.09	55,212.26	98,709.35	39,483.74	
19,297.64	33,248.75	5,572.63		3,007.65	91,569.05	60,277.80	151,846.85	60,738.74	
5,735.67	39,992.99	552.75		3,436.26	225,319.79	29,756.99	255,076.78	102,030.71	4,221.03
44,09.81	10,115.52			1,746.74	54,319.66	32,349.22	86,668.88	34,667.55	
37,662.90	5,906.63			2,613.95	82,649.74	60,395.57	143,045.31	98,306.33	3,737.78
	7,038.64	4,094.00		2,688.95	237,461.94	8,303.89	245,765.83	11,473.79	
7,335.47	13,130.47			1,710.00	13,705.89	14,978.58	28,684.47	37,208.80	
8,187.14	13,130.00			5,429.66	26,746.80	66,275.21	93,022.01	70,395.93	1,219.16
20,037.02	15,193.67	42,767.83		3,604.71	110,915.91	65,073.92	175,989.83	39,665.81	3,410.61
10,795.35	4,945.19			3,270.19	67,623.53	31,540.99	99,164.52	39,985.72	806.40
10,743.16	38,287.73	4,232.00		2,455.35	63,698.33	36,265.97	99,964.30	54,290.91	
5,137.80	35,630.86			3,484.19	103,985.15	31,742.13	135,727.28	67,207.97	
13,307.16	2,712.14	2,148.49		2,876.39	55,929.56	112,090.37	168,019.93	21,047.14	
	11,282.88	11,048.68		2,093.24	28,837.93	23,779.93	52,617.86		
12,114.49	25,538.52		\$2,214.16	3,573.35	247,908.93	29,945.68	277,854.61	111,141.84	
3,041.70	29,650.29	501.30		3,617.88	68,816.29	103,618.86	172,435.15	68,974.06	
4,672.09	32,903.55	2,785.39		3,657.10	85,121.94	34,700.60	119,822.54	47,929.01	
5,410.02	6,456.15	17,656.34		2,244.48	42,115.09	50,828.13	92,943.22	37,177.29	
25,007.92	11,008.99	6,182.46		3,839.06	61,875.77	42,732.63	104,608.40	41,843.36	
	13,102.84	7,459.56		1,810.10	72,429.02	27,444.22	99,873.24	39,949.30	6,203.24
	1,843.02			2,505.41	86,252.87	31,593.27	117,846.14	47,138.46	
	4,083.57			1,470.90	20,567.42	29,790.59	50,358.01	20,143.20	12.18
3,769.63	10,349.04			1,530.00	19,688.11	26,288.96	45,977.07	18,390.83	
48,046.22	50,670.19	9,275.58		2,784.64	423,365.81	15,223.86	438,589.67	175,435.87	12,025.28
	13,462.81			2,477.10	55,969.80	51,240.08	107,209.88	42,883.95	191.35
14,236.76	41,915.33	8,000.00		5,809.68	109,024.67	34,704.13	143,728.80	57,491.52	1,767.88
16,004.81	9,121.05	20,826.94		3,751.50	59,857.13	92,712.43	152,569.56	61,027.82	
1,362.86	44,267.40			4,742.81	305,227.39	50,411.43	355,638.82	142,255.53	1,419.85
4,229.36	18,204.25	4,504.68		2,622.50	53,786.97	27,670.10	81,457.07	32,582.83	80.00
11,304.36	12,799.78	6,115.72		2,335.72	46,630.02	39,064.60	85,694.62	34,277.85	130.00
	7,104.13			2,349.25	87,581.54	74,251.36	161,832.90	64,733.16	
9,487.97	5,918.84	11,488.09		3,077.96	58,220.57	65,049.07	123,269.64	49,307.86	50.00
6,822.00	11,347.11			4,562.33	86,968.48	65,121.65	152,090.13	60,836.05	
5,260.63	4,178.08			3,916.44	326,203.26	24,991.39	351,194.65	140,477.86	11,166.03
2,760.30	684,733.10	161,393.06	2,214.16	11,800.60	4,072,125.85	1,666,436.40	5,738,562.25	2,295,424.90	36,680.79

APPENDIX

Expenditure on Construction

The following schedule shows in detail the work and Approved Expenditure on Provincial

County	Work Done During Year.						
	Miles Graded	Miles Stoned	Miles Gravelled	Tile Drain Rods	Bridges	Pipe and Tile Culverts	Other Culverts
Brant	1.	Conc. .41 1.	.....	1,024. 172.	..... 12	11 19	2 9
Bruce	1.25	.....	4.75	.....	3	4	8
Carleton	3.50	.....	0.3	.....	.....	1	2
Dufferin .....	.....	Bit Mac. .3	.....	.....	.....	5	1
Elgin .....	.05	1.6.....	.14	252.	.....	.....	.....
Essex	37	Conc. 1.89 Bit Mac. .81	1.06	255.	.....	.....	1
Frontenac .....	.....	.....	5.	.....	1	1	23
Grey .....	.25	5.25	.....	.....	.....	.....	.....
Haldimand .....	.....	.....	2.25	.....	4	4	.....
Halton	3.62	.....	.....	.....	.....	.....	.....
Hastings .....	.....	.....	.....	.....	1	.....	.....
Huron .....	.....	.....	.....	.....	1	.....	1
Kent .....	.....	Con. 1.28	.....	2,141.	2	31	3
Lambton .....	.78	.....	1.09	280.	.....	7	1
Lanark .....	.....	Bit Mac. 3.	.....	.....	.....	.....	.....
Leeds and Grenville	.....	.....	.....	.....	.....	.....	.....
Lennox and	.....	.....	.....	.....	1	1	.....
Addington	1.75	.....	.....	.....	.....	.....	.....
Lincoln .....	.....	.....	.....	.....	1	.....	.....
Middlesex .....	.....	.....	.....	.....	.....	9	.....
Norfolk	0.79	Bit Mac. 2.23	.....	.....	.....	.....	.....
Northumberland	.....	.....	4.	.....	.....	44	1
and Durham	2.25	.....	.....	.....	.....	14	4
Ontario	1.75	.....	.....	.....	.....	.....	.....
Oxford .....	.....	.....	.....	.....	.....	.....	.....
Peel .....	.....	.....	.....	7,644.	1	1	.....
Perth .....	.....	.....	.....	.....	.....	.....	.....
Peterboro .....	.....	.....	.....	.....	.....	14	.....
Prescott and Russell	1.75	Bit Mac. 4.25	.....	.....	.....	.....	.....
Prince Edward .....	.....	Bit Mac. .7	.....	.....	.....	.....	.....
Renfrew .....	.....	4.2 Con. .1	.....	.....	.....	19	5
Simcoe	3.	2.	4.5	.....	2	20	.....
Stormont, Dundas	.....	.....	.....	.....	.....	.....	.....
and Glengarry	9.75	24.25	.....	.....	3	.....	7
Victoria	3.75	1.	.25	30.3	.....	15	.....
Waterloo .....	.....	Con. 1.75	1.75	.....	1	1	.....
Welland .....	.....	Bit Mac. 2.66	.....	.....	.....	.....	.....
Wellington .....	.....	2.67	.....	.....	1	1	1
Wentworth	1.50	1.	.....	.....	1	.....	.....
York .....	.....	Bit Mac. 3.25 Asp.Con. 2.02 Brick .81	.....	7.27	1	11	14
Totals	34.41	*68.43	25.09	11,871.	35	233	83

* Includes 42.97 miles W. B. Macadam, 17.20 miles Bituminous Macadam, 5.43 miles Concrete, 2.02 miles Asphaltic Concrete, 0.81 miles Brick.

No. 2

on Provincial County Roads.

County Roads during 1920, upon which Provincial Subsidies were paid during 1921.

Roads and Culverts	Bridges	Special Grants to Towns and Villages	Total Approved Expenditure on Construct'n	Total Approved Expenditure on Mainten'nce	Total Approved Expenditure	Gov't Grant
54,168.90			54,168.90	34,590.81	88,759.71	53,255.83
58,794.38	22,849.77	717.10	82,361.25	10,483.38	92,844.63	55,706.78
54,208.80	19,326.29		73,535.09	14,990.75	88,525.84	53,115.50
1,641.78	292.20		1,933.98	1,328.54	3,262.52	1,957.51
25,664.68	1,190.55	2,735.00	29,590.23	24,451.69	54,041.92	32,425.15
103,034.53			103,034.53	18,905.06	121,939.59	73,163.75
				14,797.41	14,797.41	8,878.45
132,267.14	2,693.98		134,961.12	16,179.37	151,140.49	90,684.29
		3,099.35	3,099.35	3,848.53	6,947.88	4,168.73
14,744.02	84,862.56		99,606.58	3,137.70	102,744.28	61,646.56
				74,877.87	74,877.87	44,926.72
	10,909.00		10,909.00	14,166.74	25,075.74	15,045.44
42,763.31	12,290.33		55,053.64	7,137.11	62,190.75	37,314.45
6,295.42	12,023.44	1,887.51	20,206.37	13,145.43	33,351.80	20,011.08
89,095.16			89,095.16	10,111.27	99,206.43	59,523.86
2,177.16	1,740.10		3,917.26	33,452.98	37,370.24	22,422.14
	957.25		957.25	18,593.97	19,551.22	11,730.74
44,423.02			44,423.02	10,450.79	54,873.81	32,924.29
34,300.00			34,300.00	22,877.47	57,177.47	34,306.48
5,641.74		728.85	6,370.59	19,150.69	25,521.28	15,312.77
				12,570.39	12,570.39	7,542.23
	48.40		48.40	1,292.03	1,340.43	804.26
2,535.63	988.40		3,524.03	12,012.76	15,536.79	9,322.07
101,630.00	800.00	8,000.00	110,430.00	5,735.15	116,165.15	69,699.09
				14,190.00	14,190.00	8,514.00
116,962.26	147.07		117,109.33	2,048.54	119,157.87	71,494.72
31,728.17	3,204.41	9,908.40	44,840.98	21,150.38	65,991.36	39,594.82
285,484.36	7,804.83		293,289.19	30,526.75	323,815.94	194,289.56
15,144.38			15,144.38	8,881.06	24,025.44	14,415.27
38,172.76	5,581.45		43,754.21	5,330.57	49,084.78	29,450.87
41,949.59			41,949.59	18,942.77	60,892.36	36,535.42
23,810.17	6,858.88		30,669.05	29,682.99	29,682.99	17,809.79
				8,519.74	39,188.79	23,513.27
106,622.18	6,960.56		113,582.74	18,937.26	132,520.00	79,512.00
1,433,259.54	201,529.47	27,076.21	1,661,865.22	556,497.95	2,218,363.17	1,331,017.90

APPENDIX

EXPENDITURE ON MAINTENANCE

(Not Including Provincial

The following schedule shows in detail the work and Approved Expenditure on Maintenance

County	Grading	Culverts	Resurfacing	Dragging	Oiling or Tarring
	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
Brant	1,106.86	130.48	17,223.94	2,394.66	603.68
Bruce	5,543.71	1,106.15	15,477.62	996.10	10,837.71
Carleton	5,490.15	902.40	47,099.52	708.32	127.97
Dufferin	12,401.17	143.38	39,783.15	782.53	54.70
Elgin	6,056.17	1,026.67	43,764.18	4,970.31	128.06
Essex		245.48	13,514.79	15,327.85	
Frontenac		11.10	31,555.88		
Grey	2,962.93	3,497.44	47,424.37	21.50	
Haldimand		16.20	6,519.44	1,083.60	1,027.45
Halton	1,042.87	515.96	10,819.48	428.90	
Hastings	5,811.30	1,170.64	56,697.63		347.47
Huron	7,468.83	2,726.32	42,145.57	1,252.51	
Kent	2,208.58	431.09	15,963.73	11,533.71	
Lambton	3,474.50	111.37	25,627.45	5,916.12	
Lanark	5,895.51	85.00	25,425.33		
Leeds and Grenville	25,517.19	3,509.62	81,771.98	1,153.00	
Lennox and Addington	1,049.00	297.80	21,006.02		3,073.95
Lincoln	637.43	115.65	15,793.40	4,421.67	
Middlesex	9,511.07	2,787.65	72,302.07	6,739.61	
Norfolk	5,352.92	452.60	21,588.00	1,627.64	
Northumberland and Durham	11,405.49	1,954.31	32,238.22	2,213.44	
Ontario	6,902.85	364.15	29,696.19	1,505.02	1,140.00
Oxford	450.48	1,765.83	21,226.95	379.10	1,265.52
Peel	1,298.38	189.64	26,169.70	1,607.54	1,868.17
Perth	2,871.42	249.37	22,618.88		
Peterboro	1,095.99	371.48	21,674.63	229.05	
Prescott and Russell	5,532.08	499.80	4,294.80	2,827.73	
Prince Edward	4,928.25	731.07	43,301.39		
Renfrew	2,548.93	1,040.56	23,363.99	1,548.55	
Simcoe	11,716.19	418.31	73,348.55	830.40	329.05
Stormont, Dundas and Glengarry	6,938.07	1,999.55	31,496.64	2,757.75	1,040.92
Victoria	3,055.59	199.74	21,271.57	691.10	134.42
Waterloo	1,364.42	636.96	31,741.32	1,657.05	637.90
Welland	7,439.00	88.50	63,786.77	825.65	2,151.88
Wellington	5,414.17	2,648.31	48,723.28	863.17	5,448.06
Wentworth	8,621.00		50,131.30		10,752.64
York	4,253.74	942.28	3,780.65	1,454.95	
Totals	187,366.24	33,382.86	1,200,368.38	78,748.53	40,969.55

No. 3

ON COUNTY ROADS.

County Roads)

on County Roads during 1920 upon which Provincial Subsidies were paid in 1921.

Shovelling Snow	Bridges	Ditching and Draining	Cutting Weeds and Brush	Wire Fence Bonus	Total Expenditure	Total Government Grant, 40%
\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
2,098.79	650.90	.....	288.10	.....	24,497.41	9,798.96
2,743.55	1,472.56	.....	.....	.....	27,339.69	10,935.88
1,123.99	2,905.34	.....	106.00	.....	69,173.43	27,669.37
1,479.40	61.91	276.05	156.70	.....	55,212.26	22,084.90
2,532.22	909.79	156.45	807.31	.....	60,277.80	24,111.12
93.05	500.38	75.44	.....	.....	29,756.99	11,902.80
509.43	144.75	.....	.....	.....	32,349.22	12,939.69
5,112.28	90.90	369.75	.....	916.40	60,395.57	24,158.23
677.65	7.00	.....	.....	.....	8,303.89	3,321.56
475.78	467.24	200.90	.....	.....	14,978.58	5,991.43
587.20	2,008.44	.....	.....	.....	66,275.21	26,510.08
3,630.90	7,502.32	.....	.....	.....	65,073.92	26,029.57
48.80	912.89	426.19	16.00	.....	31,540.99	12,616.40
473.87	48.30	118.86	Opertg. Ferry	.....	.....	.....
.....	336.29	.....	495.50	.....	36,265.97	14,506.39
130.10	8.48	.....	.....	.....	31,742.13	12,696.85
700.95	622.41	51.00	.....	52.75	112,090.37	44,836.07
4,640.30	409.00	.....	854.28	.....	23,779.93	9,511.97
4,625.85	4,367.23	1,676.66	1,608.72	.....	29,945.68	11,978.27
3,820.87	942.97	Guard Rail	.....	.....	103,618.86	41,447.54
2,316.67	700.00	681.63	233.97	.....	34,700.60	13,880.24
3,239.23	273.24	.....	544.42	207.53	50,828.13	20,331.25
1,229.00	936.76	.....	316.10	.....	42,732.63	17,093.05
433.89	628.60	.....	.....	.....	27,444.22	10,977.69
1,950.45	232.30	.....	.....	.....	31,593.27	12,637.31
418.80	2,163.88	.....	164.00	171.13	29,790.59	11,916.24
1,845.23	.....	.....	224.22	.....	26,288.96	10,515.58
1,386.70	892.67	.....	.....	.....	15,223.86	6,089.54
269.35	5,100.92	.....	831.83	.....	51,240.08	20,496.03
3,864.92	994.06	.....	.....	1,210.95	34,704.13	13,881.65
4,428.84	807.06	.....	942.60	.....	92,712.43	37,084.97
345.21	154.87	14.70	484.55	1,318.35	50,411.43	20,164.57
395.39	3,102.16	Storm Fence	.....	.....	27,670.10	11,068.04
1,168.84	152.50	167.30	136.60	15.60	39,064.60	15,625.84
3,703.43	652.60	.....	.....	892.23	74,251.36	29,700.54
220.40	700.89	.....	.....	.....	65,049.07	26,019.63
2,717.02	1,090.11	.....	.....	.....	65,121.65	26,048.66
65,438.35	42,951.72	4,214.93	8,210.90	4,784.94	24,991.39	9,996.56
.....	.....	.....	.....	.....	1,666,436.40	666,574.47

APPENDIX No. 4

EXPENDITURE ON MAINTENANCE ON PROVINCIAL COUNTY ROADS

The following schedule shows in detail the work and Approved Expenditure on Provincial County Roads during 1920, upon which Provincial Subsidies were paid during 1921.

County	Grading	Culverts	Resurfacing	Drugging	Oiling or Tarring	Snow Shovelling	Bridges	Ditching and Draining	Cutting Weeds and Brush	Wire Fence Bonus	Total Expenditure	Total Government Grant 60%
	\$	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
Brant	2,794.35	54.14	27,936.59	1,363.68	1,628.07	487.95	147.86		178.17		34,590.81	20,754.49
Bruce	961.43	295.43	6,270.50	784.54		1,956.73	214.73				10,483.38	6,290.03
Carleton	1,423.28	177.95	12,294.17	50.00	421.12	220.75	403.48				14,990.75	8,994.45
Dufferin	39.25		1,001.90	13.20		274.19					1,328.54	797.12
Elgin	1,695.91	143.33	19,426.93	1,738.95	507.22	583.33	13.79				24,451.69	14,671.01
Essex	150.70	88.48	13,829.30	4,543.87	137.65	155.06		44.00			18,905.06	11,542.04
Frontenac	411.84	6.25	14,077.51			156.05	145.76				14,797.41	8,878.45
Grey	321.40	221.65	12,045.89	121.80		2,733.39	23.10				16,179.37	9,707.62
Haldimand		31.10	2,197.23	966.30		351.55	240.75			432.90	3,848.53	2,309.12
Halton		85.70	2,262.95	615.75		169.30	4.00	61.60			3,137.70	1,832.62
Hastings	14,376.64	887.52	59,170.46			31.30	411.95				74,877.87	44,926.72
Huron	689.83	292.10	11,042.85	409.45		1,055.00	677.51				14,166.74	8,500.04
Kent	996.28	43.50	1,318.77	1,646.80			2,606.27		151.83		7,137.11	4,282.27
Lambton	2,772.85	74.06	8,040.65	1,411.79		244.40	380.26	373.66	221.42		13,145.43	7,887.26
Lanark	2,545.39	250.00	5,452.15		1,863.73						10,111.27	6,066.76
Leeds and Grenville											33,452.98	20,071.79
Lennox and Addington		316.91	31,427.73			1,194.00	514.34				18,593.97	11,156.38
Lincoln	2,381.51	518.84	11,810.70	1,707.11		1,371.79	130.15	394.92	49.10		10,450.79	6,270.47
Middlesex	199.85	131.20	8,929.05	460.12		664.78	12.34	4.35			22,877.47	13,726.48
Norfolk											19,150.69	11,490.42
Northumberland and Durham	1,300.00	1,100.00	18,400.00	786.31		941.16	350.00		278.50		12,570.39	7,542.23
Ontario	3,095.58	504.59	13,405.34	705.72	223.25	861.00	76.71		97.40		1,282.03	775.22
Oxford		401.92	11,667.99	56.25	35.27	311.56					12,012.76	7,207.65
Peel	8.50	12.25	551.75	164.40	32.00	284.25	238.88				5,735.15	3,441.10
Perth	2,233.27		8,419.65			1,285.18	74.66				14,190.00	8,514.00
Peterboro											2,048.54	1,229.12
Prescott and Russell	1,178.56	230.15	2,420.76	1,126.81		689.15	89.72	42.00	97.20			

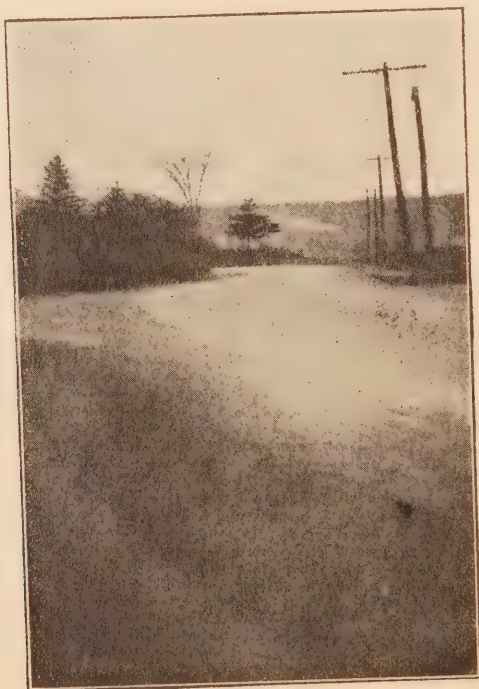
Prince Edward	605.42	351.90	11,530.43	.....	1,249.60	426.50	26.15	.....	297.85	21,150.38	12,690.23
Renfrew	123.55	79.89	1,068.55	538.60	.....	88.75	10.00	541.90	.....	30,526.75	18,316.05
Simcoe	2,624.85	289.50	15,949.68	84.00	.....	1,564.56	137.54	123.55	454.20	8,881.06	5,328.64
Stormont, Dundas and Glengarry	2,977.80	630.90	16,685.45	421.51	6,353.30	2,387.31	528.58	.....	.....	5,330.57	3,198.34
Victoria	601.84	136.00	6,817.19	313.40	68.73	175.60	12.00	135.20	.....	18,942.77	11,365.66
Waterloo	2,944.38	266.62	1,000.10	49.30	1,070.17	.....	.....	.....	533.41	29,682.99	17,809.79
Welland	1,639.30	30.75	14,797.79	407.10	1,687.08	245.55	.....	.....	.....	8,519.74	5,111.84
Wellington	1,693.05	1,495.68	19,015.47	932.20	3,135.99	2,877.19	.....	.....	.....	18,937.26	11,362.36
Wentworth	499.36	.....	6,898.78	.....	1,023.00	98.60	.....	.....	.....	.....	.....
York	1,565.98	178.25	4,372.83	1,287.45	9,424.90	2,069.89	46.96	.....	.....	.....	.....
Totals	54,851.97	9,326.56	401,537.09	22,726.41	29,063.48	25,946.82	7,517.49	1,323.32	2,486.45	556,497.95	333,898.77

APPENDIX No. 5.

EXPENDITURE ON TOWNSHIP ROADS.

The following schedule shows in detail the work and approved expenditure on Township Roads during 1920, and upon which Provincial subsidies were paid in 1921, under the provisions of the Ontario Highways Act.

Number of Townships	Approved Expenditure for the year.				
	Roads and Culverts	Bridges	Mainten- ance	Machinery	Purchase of Gravel Pits
184	\$432,618.62	\$270,596.52	\$828,027.27	\$91,704.24	\$8,513.47
Total Approved Expenditure	Government Grant 40%	Government Grant 20%	Government Grant 20%	Total Expenditure	
\$1,631,460.12	\$326,291.95	\$36,767.60	\$14,707.03	\$340,998.98	



Easy curves replaced sharp turns on the Provincial Highway between Dundas and Hamilton.

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ANNUAL REPORT

OF THE

Department of Public Highways

ONTARIO

1921

PRINTED BY ORDER OF
THE LEGISLATIVE ASSEMBLY OF ONTARIO



TORONTO:

Printed and Published by Clarkson W. James, Printer to the King's Most Excellent Majesty

1923



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TO HIS HONOUR HENRY COCKSHUTT,
Lieutenant-Governor of the Province of Ontario.

MAY IT PLEASE YOUR HONOUR:

I herewith beg to present for your consideration the Annual Report of the Department of Public Highways, relating to Highway Improvement in the Province of Ontario during the year 1921.

Respectfully submitted,

F. C. BIGGS,
Minister of Public Works and Highways.

TO THE HONOURABLE F. C. BIGGS,
Minister of Public Works and Highways,
Ontario.

SIR,—I have the honour to submit the Annual Report of the Department of Public Highways for the year 1921, having special reference to work on the Provincial Highway System under the Provincial Highways Act; work carried on by the several counties of Ontario under the Highway Improvement Act; and by township councils whose work is now subsidized under the Ontario Highways Act, 1920.

Reference is also made to the operation of the Motor Vehicles Act; and to other services within the purview of the Department of Public Highways.

I have the honour to be, Sir,

Yours respectfully,

W. A. McLEAN,
Deputy Minister of Highways.

Parliament Buildings, Toronto, April 26th, 1923.



HAMILTON-QUEENSTON PROVINCIAL HIGHWAY

Top—View of right-of-way across Red Hill Creek, east of Hamilton, prior to commencement of work in 1919.

Bottom—View from same location on completion of pavement.

HIGHWAY IMPROVEMENT IN ONTARIO

REPORT OF W. A. McLEAN, DEPUTY MINISTER

THE rural roads of Southern Ontario are now being methodically constructed and improved in a manner that pertains to few countries, and a continuance of which policy will finally result in a completed network of roads serving each farm and every community, and commensurate with the agricultural, commercial and industrial needs of the Province.

To the casual observer, the work on Provincial highways may seem to be of a disconnected and scattered nature. Nevertheless, the work is being carried out under a well defined system, which is steadily producing a continuous trunk-line plan of roads. It is a cardinal principle that roads should be constructed in proportion to the traffic over them. All parts of the Provincial system do not carry an equal amount of traffic. Near cities, traffic is dense, and paved roads are necessary to give service and reduce maintenance costs; in industrial communities, heavy motor truck traffic prevails and strong foundations are essential; on the outer branches of the system, traffic of all kinds is proportionately light, and tarred macadam or even gravel roads are economical and render every essential service. Continuity of Provincial roads is being steadily developed, and what may appear to the general public to be scattered improvements will in a short period be connected into a well standardized system of Provincial highways worthy of the name.

County councils, operating under the Highway Improvement Act, on 9,609 miles of county roads, are carrying out work on a well devised system of leading market roads, which branch from the Provincial highways, local markets and shipping centres.

The result is that, while a large number of farms are directly served on Provincial Highways and county roads, few of the remaining country homes are more than two or three miles away from such main roads. Township effort is thus greatly stimulated in the betterment of short local roads; and township councils and individual effort are now strongly directed to the improvement of what are classed as township roads. That is, property owners who, prior to the construction of the main roads, saw 6, 8 or 10 miles of bad road to be constructed from their farms to the local market, now find that there are only 2 or 3 miles to be graded and gravelled to link them up with an established main road. The result, as previously stated, is a marked stimulus of local effort, with the prospect that in a very few years the network of good roads in Ontario will be complete.

PROVINCIAL HIGHWAYS

The model set by Provincial highways is effecting a marked improvement throughout the Province in the methods of constructing and maintaining township and county roads. Provincial highways have demonstrated to the public, and to municipal councils, the advantages of better grading, better drainage, spreading of gravel, systematic dragging, and other details of construction and maintenance.

Instruction and advice have been given for many years to municipal officers with respect to such matters, but old methods were established from statute labour practice, and had a firm hold on the public mind; and it has been necessary to show and prove, by actual construction and maintenance, the weakness of the methods that have so generally prevailed. Provincial highways are therefore not merely valuable in themselves, but their influence on the remaining roads is of inestimable value to the Province.

During the year construction work was carried out at many points of the Province. In addition extensive maintenance was established over the entire system in an effort to improve those sections which were not to immediately undergo construction in such a manner that they would be in a first-class condition for traffic.



HAMILTON-QUEENSTON PROVINCIAL HIGHWAY
Asphaltic concrete surface, east of Stoney Creek.

A more detailed report of the work done will be found on the following pages. Mention might be made, however, of the following more or less outstanding features of the season's operations.

On the Ottawa-Pembroke Road, south of Cobden, at the southerly end of Muskrat Lake, a fill 4,000 feet long was constructed across the marsh. Six miles of bituminous macadam and $3\frac{3}{4}$ miles of asphaltic concrete surfaces were constructed on the Ottawa-Point Fortune Road. On the Ottawa-Prescott Road five bridges, work on which had been started in 1920, were completed. Easterly from Kingston on the River Road $9\frac{1}{2}$ miles of waterbound macadam were built. Seven miles of macadam were laid from Belleville to Shannonville. Between Oshawa and Belleville over fifty miles of road were gravelled. South of Peterborough 4.3 miles of macadam base were completed. Easterly from

Brantford a concrete pavement was constructed over a length of 5 miles and the pavement through Cainsville and Echo Place was completed. South from London, to Lambeth, a concrete pavement 5 miles long was built. The surfacing of the Hamilton-Queenston Road progressed rapidly with the completion of 11.3 miles of bituminous macadam surface.

Probably the largest single piece of work on the system was that south of Clappison's Corners, where a rock cut through the Niagara escarpment was necessary in order to strengthen the road and eliminate three very sharp, steep turns. At Clappison's Corners the Hamilton-Guelph and the Hamilton-Toronto Provincial Highways intersect, traffic from both roads reaching Hamilton through this cut.

The new entrance of the Toronto and Hamilton Highway (Lake Shore Road), the Dundas Street Provincial Highway, and the Hamilton-Guelph Provincial Highway, which involves the construction of two long and one short bridges, was carried forward. The bridges were practically completed and the grading of the approaches commenced.

These, and many other pieces of work, were continued or completed, and in addition a large mileage of road was graded, culverts constructed and the permanent work necessary before the final surface could be laid was completed. On many miles of the system gravel was applied, and this, followed by a continuous system of patrol maintenance, resulted in a great improvement in the condition of the surface. The policy of developing the surfaces of these roads to a high standard as rapidly as possible has brought about gratifying results.

COUNTY ROADS

A system of county roads has now been established in every county in the Province. There are approximately 49,874 miles of road in the area covered by the County Road System, of which 54.29 per cent. has been surfaced with gravel, broken stone or other more permanent material; a very creditable record for the municipalities.

Since the passing of The Highway Improvement Act, and to the end of 1921, a total of \$36,121,903.97 has been spent on construction and maintenance of county roads, of which the Province has contributed \$15,523,047.84. This includes the county expenditure of 1921, on which the Provincial grant was paid in 1922.

The total length of county road systems at the end of 1921 amounted to 9,610 miles, comprising 1,949 miles of provincial county roads and 7,661 miles of county roads. This is approximately 19.26 per cent. of the total road mileage in the area covered by the County Road System.

The following shows the mileage of the various types of road on the County Road System at the end of 1921:

Gravel roads.....	5,665.0 miles
Water-bound macadam roads.....	1,878.0 "
Bituminous surfaces.....	182.0 "
Bituminous penetration roads.....	94.0 "
Concrete.....	65.0 "
Asphaltic concrete.....	13.5 "
Brick.....	0.5 "

Total.....7,898.0 miles

This is approximately 82 per cent. of the road mileage under the County Road System.

Expenditure on county roads in 1921 was as follows:

Construction

	Total Expenditure.	Provincial Grant.
Provincial County Roads.....	\$2,783,756 21	\$1,670,253 73
County Roads.....	5,429,335 93	2,171,734 37
Total Construction.....	\$8,213,092 14	\$3,841,988 10

Maintenance

Provincial County Roads.....	\$659,081 71	\$395,449 03
County Roads.....	2,206,114 54	882,445 79
Total Maintenance.....	\$2,865,196 25	\$1,277,894 82

Summary

Total Construction	\$8,213,092 14	\$3,841,988 10
Total Maintenance.....	2,865,196 25	1,277,894 82
Total Expenditures	\$11,078,288 39	\$5,119,882 92

The work on which the foregoing expenditures for construction were made included the following:

Grading.....	187.38 miles
Gravelled surface.....	218.76 miles
Waterbound macadam.....	302.62 "
Cement concrete.....	30.84 "
Bituminous penetration.....	39.86 "
Asphaltic concrete.....	4.84 "

Total surfaced..... 596.92 miles

Bridges over 10 feet span.....	179
Concrete slab culverts.....	428
Pipe and tile culverts.....	2,099

Among the special features of road improvement effected during the year the following works may be mentioned:

BRANT COUNTY

The Brantford-Oakland Toll road was purchased by the county, towards which the Province contributed 40 per cent. Several timber trestle bridges were replaced with concrete box culverts and earth fills, one fill consisting of approximately 12,000 cubic yards of material, the width of grade being 28 feet. In addition 8 miles of road were graded to the standard width of 28 feet and 57 pipe and 7 concrete box culverts were built.

BRUCE COUNTY

In a series of sections, varying in length from 2 to 4 miles, 21 miles of 16-foot gravel road were built and graded to a width of 28 feet. In addition seventeen bridges, varying in span from 16 to 200 feet with 20-foot roadway, were built; also 22 concrete box culverts and 121 pipe culverts. The work of grading and laying a rubble base through the Eastnor swamp is in progress, and an expenditure of \$22,597.61 was made during the year.

CARLETON COUNTY

Six toll roads in the vicinity of the city of Ottawa were purchased at a cost of \$202,248.13, of which the Province paid 40 per cent. Four miles of 18-foot waterbound macadam, 9 inches deep, were built on Provincial County Road No. 89, known as the Morrisburg road. The work was commenced at the southerly boundary of the county, and is proceeding northerly toward the city of Ottawa and it is expected that in 1922 the work will be linked up with the Ottawa suburban road, thereby providing an excellent and continuous stretch of road for a distance of 26 miles on one of the main highways in the eastern part of the Province. The road is graded to a width of 28 feet and numerous pipe and concrete box culverts were built. A special feature with respect to this work is the elimination of several dangerous corners; this was accomplished by purchasing land for widening and increasing the curvature. On county roads, several stretches of gravel and waterbound macadam roads, varying from



CARLETON COUNTY ROAD

Asphaltic concrete surface 20 feet wide on Metcalfe Road, Ottawa Suburban Roads Commission.

one to four miles in length, and amounting to 26 miles, were built. Nine bridges were built at a cost of \$78,846.36, the most important structures being the Carlsbad Springs bridge, the Steven's Creek bridge, the Kenmore bridge and Burritt's Rapids bridge, consisting of 50-foot, 60-foot, 50 and 72-foot (2 spans) and two 100-foot spans respectively. The bridges are of steel superstructure and concrete substructure.

ELGIN COUNTY

The Silver Creek bridge, 16-foot span and 100 feet wide, was built on County Road No. 42, township of Malahide. Approximately 15,000 cubic yards of earth was used as fill on this bridge. The chief feature, however, is the maintaining of the gravel roads. Excellent results are obtained at a very low cost. Approximately 150 miles of gravel roads were resurfaced during the year.

ESSEX COUNTY

Two sections of 18-foot concrete pavement were built; 1.20 miles westerly from the village of Belle River and 0.70 miles easterly from Pike Creek on Provincial County Road No. 86. On County Road No. 31 an 18-foot concrete pavement one mile in length was built, extending northerly from the limit of the town of Leamington. On Provincial County Road No. 77 a 3-inch tar penetration surface on a 6-inch stone base 18 feet wide and 1 mile long was built through the police village of Harrow. In addition, 40 miles of gravel road were built in stretches varying from $1\frac{1}{2}$ to 9 miles long.

GREY COUNTY

Eight miles of water-bound macadam road, 18 feet wide and 10 inches deep, were built on the Owen Sound-Thornbury road. In connection with this work unusual difficulties arose and it was necessary to reduce many grades, building the road through low-lying land and straightening the road in many places.



ESSEX COUNTY ROAD

Bituminous macadam surface 24 feet wide in the village of Harrow.

In the vicinity of Rock Mills and Priceville, 7 miles of gravel road were built; also 12 miles of gravel road from Hanover to Clifford.

HALDIMAND COUNTY

Over 40 miles of road were graded to the standard width of 26 feet; also the road between Hagersville and Selkirk, 10.5 miles long, was given a 4-inch coat of crushed stone and the travelled surface widened to 14 feet. Three sections of gravel road, 2, 4 and 5 miles in length and totalling 11 miles, were constructed.

HALTON COUNTY

On a section of the Oakville-Georgetown road, 4 miles of 10-foot concrete pavement with 4-foot stone shoulders were built. The road was graded to a width of 28 feet. The county, in a series of sections, constructed, in all, 20 miles of water-bound macadam road 10 to 16 feet wide.

HURON COUNTY

The completion of the Grand Bend bridge over the Aux Sables river between the counties of Huron and Lambton; the building of 10.5 miles of gravel road in sections varying from 2 to 4 miles, graded to a width of 26 feet; and the resurfacing of approximately 180 miles of gravel roads were the main features of the year's work.

KENT COUNTY

On the Wallaceburg-Dresden road the 16-foot concrete pavement commenced in 1920 was extended a distance of $2\frac{1}{2}$ miles on the Wallaceburg end and 2 miles on the Dresden end. It is expected that the remaining 5 miles of this road will be completed in 1922, thereby providing a concrete pavement between the towns of Wallaceburg and Dresden, a distance of 12 miles. On the Dresden-Thamesville road, a 16-foot concrete pavement $2\frac{1}{2}$ miles long was built extending westerly from the C. P. R. North Thamesville station. On County Road No. 8, in the vicinity of Paincourt, a 16-foot concrete pavement, $1\frac{1}{2}$ miles long, was built and linking up with the concrete pavement built by the Chatham Suburban Roads Commission. Approximately 21 miles of tile under-drains were laid during the year. Three bridges were built, consisting of 18, 50 and 70-foot span with 20-foot roadways. In addition, 25 miles of roads were gravelled.

LAMBTON COUNTY

Grade reduction at several points and the building of four bridges varying in span from 20 to 90 feet with 18-foot roadways were completed.

LANARK COUNTY

On the Perth-Lanark road, from Perth northerly to Balderson, $2\frac{1}{2}$ miles of 3-inch tar penetration surface on 8-inch stone base 16 feet wide were built and the road graded to a width of 28 feet. In addition 15 pipe and 12 concrete box culverts were built. On county roads, in a series of sections varying from $1\frac{1}{4}$ to $5\frac{1}{2}$ miles, 14.50 miles of water-bound macadam road were constructed with a width of 12 feet.

LINCOLN COUNTY

Several sections of water-bound macadam road were built, varying in length from 1 mile to $4\frac{1}{2}$ miles and totalling 16 miles. In addition, 3 miles of gravel road were built on the lake road between Port Dalhousie and Niagara-on-the-Lake. Three bridges were built, the chief one being a 54-foot span with a 20-foot road over the Four-mile Creek. Two hundred and sixty-one pipe and 6 concrete box culverts were also built.

LENNOX AND ADDINGTON

One mile of water-bound macadam road, 16 feet wide and 10 inches deep, was built on the Hamburg road. The right-of-way was widened from 40 to 66 feet. Two stretches of water-bound macadam road, $2\frac{1}{2}$ miles at 16 feet wide and 3 miles at 10 feet wide, were built on the Yarker road.

MIDDLESEX COUNTY

Twelve miles of gravel roads were constructed in a series of sections varying in length from $1\frac{1}{2}$ to 4 miles, together with the resurfacing of approximately 125 miles. The Bear Creek bridge in the township of Lobo, having a clear span of 54 feet with a 20-foot roadway, was the chief structure erected during the year.

NORFOLK COUNTY

On the Simcoe-Port Dover road, a 3-inch tar penetration surface on a 6-inch stone base 16 feet wide was built, extending from the limit of Port Dover easterly $3\frac{1}{2}$ miles. This completes this type of road between the towns of Simcoe and Port Dover, a distance of 7 miles. In addition, $1\frac{1}{2}$ miles of a similar road were built in the vicinity of Port Rowan. Four miles of gravel road were built on County Road No. 17, extending westerly from Vanessa station. A 55-foot span bascule bridge with a 16-foot road and 6-foot sidewalk was built over the River Lynn at Port Dover at a cost of \$77,344.66.

UNITED COUNTIES OF PRESCOTT AND RUSSELL

On the Hawkesbury-Vankleek Hill road $5\frac{1}{2}$ miles of 3-inch asphalt penetration surface on 6-inch stone base 16 feet wide were built. On the Vankleek Hill-St. Eugene road, a similar type of road was built, 5 miles long. In a series of sections, 20 miles of water-bound macadam road 16 feet wide were built. In addition, 59 pipe and 31 concrete box culverts were built; also eleven bridges varying in span from 16 to 40 feet with 18-foot roadways.

RENFREW COUNTY

The county, in a series of sections, constructed 46 miles of water-bound macadam and gravel roads 10 to 16 feet wide; also 7 miles of road were graded ready for a stone surface. In addition, 171 pipe culverts were laid and 36 concrete box culverts and 7 bridges built.

SIMCOE COUNTY

Two miles of 3-inch tar penetration surface on 6-inch stone base 18 feet wide were built on the Penetang road, extending southerly from the limit of the town of Penetang. A part of the Orillia-Atherly road was constructed with water-bound macadam 20 feet wide, and given a surface treatment of tar and sand. Thirteen bridges were also built, varying in span from 16 to 60 feet, with 20-foot roadways; the bridges have steel superstructures.

UNITED COUNTIES OF STORMONT, DUNDAS AND GLENGARRY

Sixty miles of water-bound macadam roads were built in a series of sections, varying in length from 1 mile to $6\frac{1}{2}$ miles, and from 10 to 16 feet wide. In addition, 33 concrete box culverts and 4 bridges were built.

VICTORIA COUNTY

The construction of $2\frac{1}{4}$ miles of 16-foot water-bound macadam road 10 inches deep on the Lindsay-Omemee road; grade reductions in several locations, and the elimination of two railway crossings on the Lindsay-Peterborough road were the chief works for the year.

WATERLOO COUNTY

Three and one-half miles of concrete pavement 16 feet wide were built on the Elmira road. It is expected that the remaining 2 miles, together with the section of road within the town of Waterloo, will be completed in 1922, providing a continuous stretch of concrete pavement between the city of Kitchener and the village of Elmira. A further improvement on this road was carried out at St. Jacob's Hill, where the grade was reduced, the road widened and gravelled and a concrete retaining wall and gutter built. A 54-foot span bridge was built on County Road No. 25 at a cost of \$7,600.00.

WELLAND COUNTY

Seven miles of 16-foot water-bound macadam road 10 inches deep were built on the Port Colborne-Marshville road, and the road graded to a width of 28 feet. With this important link constructed, a continuous stretch of hard surface road is provided, extending from Fort Erie in the east to the town of Simcoe in the west. Between Fort Erie and Ridgeway 6 miles of 16-foot tar penetration surface were built; a continuation of the work commenced in 1920. On the Thorold stone road $2\frac{1}{2}$ miles of 3-inch tar penetration surface 16 feet wide were built; also 14 miles of water-bound macadam in a series of sections were built at a width of 10 feet.

GENERAL

The work in the remaining counties consisted chiefly in reshaping and maintaining the existing roads, building permanent structures and otherwise preparing for future work.

SUBURBAN ROADS

A provision is made under the Ontario Highways Act, that a city may co-operate with the county council in improving the leading county roads adjacent to the city and thereby obtain a more substantial type of construction for such suburban roads.

For construction and maintenance of roads which are County Roads the Province contributes 40 per cent. and the County and City each 30 per cent., and on Provincial County Roads, the Province contributes 60 per cent. and the County and City each 20 per cent.

The section of County Road designated as "Suburban" remains a County Road for which the County is responsible; the work of construction and maintenance is carried on under the direction of an engineer appointed by the Commission or may be carried on under the direction of the County Road superintendent, but subject to the instruction of the Commission.

The development of main highways has, in every country, required the co-operation of cities. In the United States, the City of Detroit is paying approximately 87 per cent. of the cost of roads in Wayne County. In New York State, the cities are paying 70 per cent. of the State expenditure.

Under the system of taxation in vogue in the United States, a much larger proportion of the cost of main highways is met by the cities than is provided in Ontario. Provision is made that the rate to be levied upon a city for suburban roads is one-half mill on the dollar, but a city council may by by-law, passed by at least two-thirds of the members present and voting thereon, appropriate

for work on suburban roads a sum not exceeding the proceeds of a rate of two mills on the dollar on the value of the rateable property in the city.

Eighteen cities of the twenty-one within the organized counties of the Province are now paying towards the construction and maintenance of suburban roads. The eighteen commissions appointed have assumed 551 miles of road. The expenditure on suburban roads in 1921 amounted to \$1,822,765.22, of which the cities paid \$484,428.67.

It is anticipated that the three remaining cities, Stratford, Belleville and Woodstock, will co-operate with their counties in the near future in improving the leading county roads adjacent to the cities.

Several of the Suburban Roads Commissions in the Province have done good work during 1921. Some have adopted the principle of building permanent pavements, others again are reshaping, widening and strengthening the existing macadam or gravel roads with the view of laying a permanent surface in the near future. The construction of permanent pavements and structures on suburban roads in the close vicinity of the city should be encouraged by all Suburban Commissions. The Ottawa Suburban Roads Commission has obtained excellent results by adopting the plan of building and preparing for permanent surfaces.

The main features of construction work carried out on Suburban Roads during 1921 are as follows:

TORONTO AND YORK ROADS COMMISSION

The City of Toronto contributes to the entire county road system; the direction of the work, however, is under control of the Commission. Through the towns of Newmarket and Weston, an asphaltic concrete surface 3 inches thick on a 6-inch concrete base and $2\frac{1}{3}$ miles long and 20 feet wide was built. On the Vaughan and Kennedy roads two sections of tar penetration roads 16 feet wide were built. In a series of sections, the Commission constructed 19 miles of water-bound macadam road 16 feet wide and the surface given a treatment of tar and sand. On the Don Mills road, a 90-foot concrete bow-string arch bridge with a 20-foot roadway was built over the Don river. The abutments for the Crousberry bridge were completed at a cost of \$18,226.17. The depth to which the footing had to be carried made this a very difficult and expensive piece of work.

OTTAWA SUBURBAN ROADS COMMISSION

The Commission constructed $12\frac{1}{2}$ miles of water-bound macadam road, 20 feet wide and 7 inches deep, in preparation for a permanent type of surfacing. Nine miles of this work was carried out on the Metcalfe road, one of the most important roads in eastern Ontario. In addition, 30 concrete box culverts and 6 bridges were built, the Saw-Mill Creek bridge being the chief feature. This is a 16-foot concrete arch 70 feet wide and was built at a cost of \$13,393.00. Twenty-one miles of macadam roads were treated with tar and sand.

BRANTFORD SUBURBAN ROADS COMMISSION

On the Burford road, 1.63 miles of concrete pavement 9 feet wide were built, commencing at the limit of the city of Brantford. The concrete pavement was laid on the north side of the road and a 10-foot strip of gravel road laid on the south side adjoining the concrete pavement. This arrangement has given excellent results and permits of a larger mileage of permanent pavement

being built. Extensive grading operations are in progress on the Cockshutt road, where grades are being reduced to a minimum and the road widened to 28 feet.

WINDSOR SUBURBAN ROADS COMMISSION

Three miles of 18-foot concrete pavement were built on Howard avenue; also two miles of grading and gravelling on County Road No. 6. An extensive programme of paving is proposed for 1922.

KINGSTON SUBURBAN ROADS COMMISSION

The chief feature of construction was the building of $2\frac{1}{2}$ miles of water-bound macadam road 16 feet wide on the Finger Board road; also several concrete culverts.



OWEN SOUND COUNTY SUBURBAN ROAD

This surface consists of a central strip of concrete pavement 9 feet wide with two 5-foot macadam shoulders. Total width of roadway 30 feet.

OWEN SOUND SUBURBAN ROADS COMMISSION

Grade reduction and widening in several places and the building of 2 miles of water-bound macadam road 16 feet wide on the Shallow Lake road were the chief points of construction carried out.

CHATHAM SUBURBAN ROADS COMMISSION

On the Chatham-Charing Cross road, 3 miles of concrete pavement 18 feet wide were built, and the road graded to a width of 28 feet. One mile of concrete pavement 16 feet wide was built on the River road west from Chatham.

ST. CATHARINES SUBURBAN ROADS COMMISSION

Two miles of concrete pavement 18 feet wide were built on Niagara street; also $\frac{1}{2}$ mile of asphaltic concrete surface on a stone base 18 feet wide. On the mountain section of the Merritton road, a strip of concrete 1,800 feet long and 9 feet wide with 6-inch concrete curb was built.

KITCHENER SUBURBAN ROADS COMMISSION

From the limit of the city of Kitchener to Bridgeport, $1\frac{1}{4}$ miles of concrete pavement 20 feet wide were built.

NIAGARA FALLS SUBURBAN ROADS COMMISSION

One and one-half miles of 16-foot tar penetration surface on stone base was built on the Thorold stone road.

WELLAND SUBURBAN ROADS COMMISSION

One mile of water-bound macadam road 18 feet wide was built on the Crowland road.

TOWNSHIP ROADS

The total approved expenditure on township roads in 1921 amounted to \$3,465,850.33, and as provided by The Ontario Highways Act, 1920, subsidies amounting to \$708,486.91 were paid, being 20 per cent. of the cost of construction, maintenance, bridges, machinery, etc., and 40 per cent. of the cost of superintendence. This expenditure relates to two hundred and ninety-four townships taking advantage of the aid, being 80 per cent. of the total number eligible for the grant. The expenditure on maintenance amounted to \$1,888,048.75, averaging approximately \$65.00 per mile; road construction, including culverts, cost \$844,829.42.

Apart from the actual financial assistance to the extent of \$708,486.91, the assistance and co-operation of the engineers of the Department have been of untold value to the townships and are having a marked effect upon the nature of township road improvement throughout the Province. In bridge and culvert construction, in the elimination of dangerous curves, brush obstructions, narrow fills, and like matters, the impetus towards prompt action and the advice and guidance in the matter of methods and costs have been found to be sound and worthy of adoption. The construction of culverts 12 and 14 feet long is, in most townships, a practice of the past. The safety, durability and economy of the Departmental type, 24 feet in length, is steadily gaining favour.

The amount of \$501,650.14 was expended during the year on township bridges, the plans and specifications for which were approved by the Department. The structures, for the most part, ranged from 14 to 60 feet in span.

Generally the method of keeping account of road expenditures is far from adequate. The practice of many townships of keeping one general account book in which are entered all receipts and payments, often irrespective of the nature of the entry, creates a serious difficulty at the close of the year, as the township treasurer has the unenviable task of segregating road expenditures and of distributing them to the roads concerned in accordance with the requirements of the regulations of the Department. A standardization of road accounting—a much needed improvement—is likely to be adopted, as it is of vital importance to adequate records of township road work.

Approximately two hundred townships have abolished or commuted statute labour and are systematically improving their roads in such a manner and at such a favourable cost in comparison with those townships where the old system is still in vogue, that the latter are openly discussing the statute labour question and it is likely to be disposed of before many years. An actual ex-

amination of the situation in townships in the counties of Bruce, Huron, Oxford, Perth and Waterloo has shown that roads kept up by the statute labour system are costing between two and three times as much to maintain as roads that are attended to on the basis of paying a fair wage for services rendered.

The appointment of a township road superintendent, so strongly advocated by this Department, has been vindicated in one hundred and fifty townships. In 1921, the expenditure on superintendence amounted to \$76,585.03, of which the Province paid 40 per cent., or \$30,634.01. Some superintendents are handicapped in their duties by a prevailing tendency on the part of the council to leave all road matters in the hands of the councillor representing each division of the township. Also in a number of townships retaining statute labour, there is a division of authority between the pathmaster and the superintendent. Generally, however, these contentious matters are on the wane and the functions of the township road superintendent becoming more definitely solved. Some of them have established patrol systems which are beginning to emulate the best practice in county road work, namely, every mile patrolled.

While there is still room for much improvement in township road systems generally, the work of the year (the second year in which the 20 per cent. subsidy has been operative) has indicated that the municipalities have a clearer conception than before of the relationship between cost and actual results, as well as of the difference between a temporary job and a lasting improvement.

REGISTRATION OF MOTOR CARS

Every motor car used on the roads of the Province is registered in the Motor Vehicles Branch of the Province. This registration includes the name, address and occupation of the owner; a description of the car, comprising make, model, engine and serial numbers, and other particulars. With each registration is issued a permit card, and two number plates, one for the front, the other for the rear of the car. Notice of transfer of ownership must also be filed in the Department. The purposes of this registration with these particulars are important, and relate not merely to the payment of the annual license fee and collection of revenue. Other objects are:

1. Traffic law enforcement; for which the use of number plates on all cars, with an up-to-date list of owners, is essential.
2. Criminal law enforcement; there are few crimes with which motor cars may not be associated, and means of tracing the movement of cars is thus invaluable.
3. The tracing of stolen cars, in which the information regarding engine numbers and the serial number of the car is especially valuable.
4. Finding the owners of cars which have been left on the roadside or elsewhere by joy-riders.

While the information required on the annual application form may seem excessive, the purpose is largely in the interest of car owners, for the protection of their traffic rights, and to aid in the recovery of stolen cars.

MOTOR TRUCKS

The growing use of heavy motor trucks is a matter of much concern to those in charge of the construction and maintenance of roads. While rapidly moving passenger cars, with pneumatic rubber tires, are requiring special treatment of road surfaces—cement concrete, asphalt, tar, oil, calcium chloride, etc.—the heavy motor truck, if unrestricted, is placing an impossible weight and stress on road foundations. When the foundation is shattered or disturbed, the disruption of the surface follows.

Trucks ordinarily carry a little more than their own weight. The present law of the Province permits a gross vehicular load of twelve tons, including the weight of the vehicle and load; so that the present load limitation recognizes what is known as the "five ton truck"—a truck which itself weighs about five tons, and which is commonly loaded with an additional weight of six or seven tons. The registration of trucks for the year shows that there was only one truck in the Province with a carrying capacity of 7 tons; two which had a rated capacity of $6\frac{1}{2}$ tons; ten with a registered capacity of 6 tons; ten carrying 5 tons, and a total of only twenty-three registered, over 5 tons.

Steel tires on motor trucks are wholly prohibited by Ontario law. Resilient tires are required, which permits the use of both solid rubber and pneumatic tires. The latter have a cushioned effect which is favourable to the road; solid rubber tires, when used after they are worn or broken, are extremely damaging to the road.

Regulation of motor trucks should tend to a reduction of weight, careful control of speed, the encouragement of pneumatic tires as opposed to solid tires, and a penalty for the use of defective rubber tires.

The numbers of the various classes of motor vehicles, dealers, chauffeurs and garages registered during the year 1921 were as follows:

Passenger Automobiles.....	181,978
Motor Trucks.....	19,554
Motor Cycles.....	4,989
Trailers.....	1,362
Manufacturers and Dealers.....	1,543
Chauffeurs.....	21,808
Garages.....	2,495

REPORT ON PROVINCIAL HIGHWAYS

By the CHIEF ENGINEER

TORONTO, January 30th, 1922.

W. A. McLEAN, ESQ.,
Deputy Minister of Highways, Ontario.

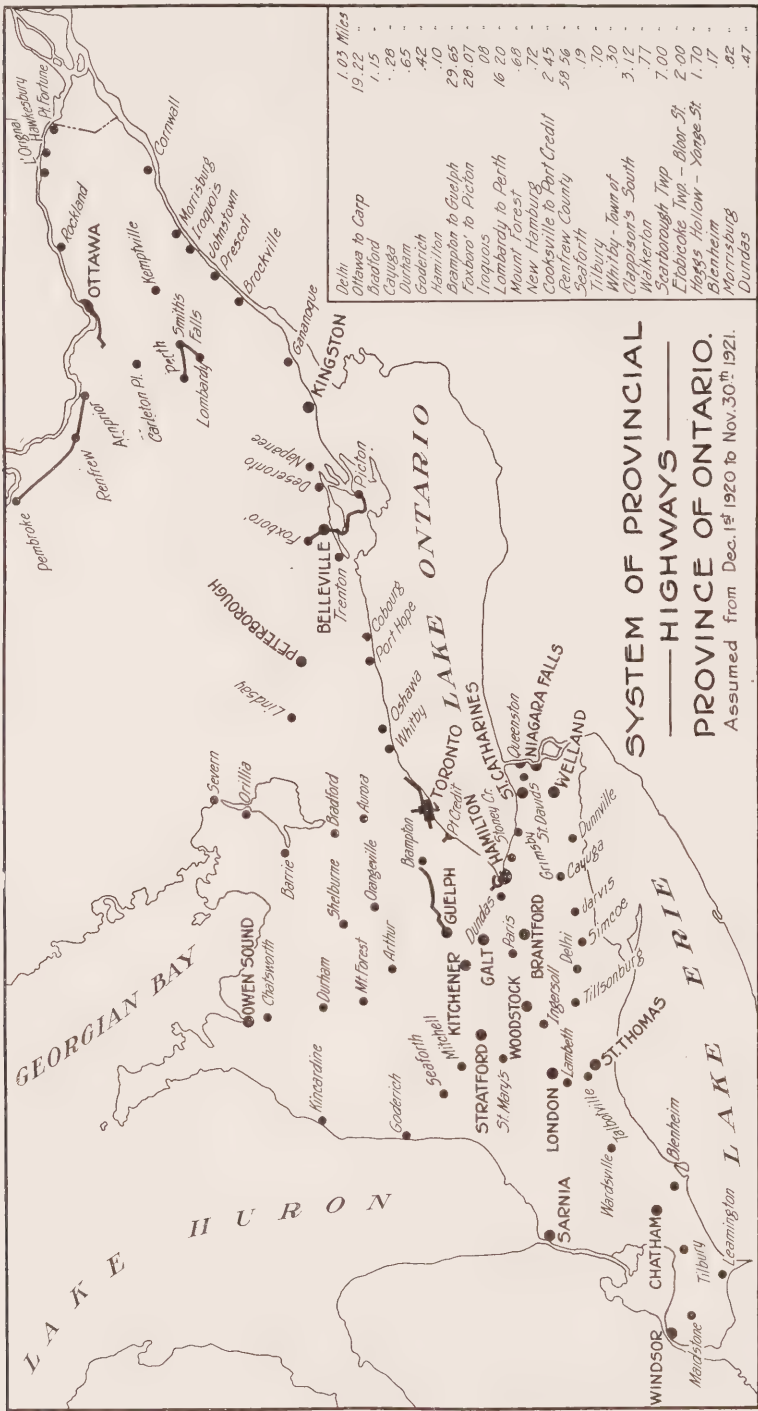
DEAR SIR:

I have the honour to report upon the work of constructing and maintaining the Provincial Highway System in the Counties of Ontario for the year beginning December 1st, 1920, and ending November 30th, 1921.

On December 1st, 1920, the system comprised a total mileage of 1,604.13 miles, as shown on Map No. 1. During the year the system was extended by adding 178.72 miles assumed, less 17.05 miles reverted, as shown on map No. 2, making a total assumed of 1,765.80 miles. A list of the roads added to the system, together with the mileage and date of designations, is as follows:

PROVINCIAL HIGHWAYS ASSUMED IN 1921

County.	Date of Designation.	Municipality.	Mileage.	County Mileage.
Bruce.....	20th of April, 1921.....	Walkerton Town.....	.77	.77
Carleton.....	16th of November, 1921.....	Huntley.....	2.75	.....
	16th of November, 1921.....	March.....	6.15	.....
	16th of November, 1921.....	Nepean.....	10.32	19.22
Dundas.....	16th of December, 1920.....	Morrisburg Village.....	.82	.....
	16th of December, 1920.....	Iroquois Village.....	.08	.90
Grey.....	6th of April, 1921.....	Durham Town.....	.65	.65
Haldimand.....	4th of May, 1921.....	Cayuga.....	.28	.28
Halton.....	4th of May, 1921.....	Esquesing.....	9.1	.....
	4th of May, 1921.....	Georgetown Town.....	1.3	.....
	4th of May, 1921.....	Acton Town.....	.50	.....
	4th of May, 1921.....	Nassagaweya.....	2.95	13.85
Hastings.....	18th of May, 1921.....	Thurlow.....	5.7	5.70
Huron.....	16th of December, 1920.....	Seaforth Town.....	.42	.....
	16th of December, 1920.....	Goderich Town.....	.19	.61
Kent.....	16th of December, 1920.....	Tilbury Village.....	.70	.....
	24th of August, 1921.....	Blenheim Village.....	.17	.87
Lanark.....	27th of April, 1921.....	North Elmsley.....	9.68	.....
	27th of April, 1921.....	Drummond.....	1.32	11.00
Leeds.....	27th of April, 1921.....	South Elmsley.....	5.20	5.20
Norfolk.....	20th of July, 1921.....	Delhi Village.....	1.03	1.03
Ontario.....	24th of August, 1921.....	Whitby Town.....	.30	.30
Peel.....	7th of May, 1921.....	Brampton Town.....	.05	.....
	27th of April, 1921.....	Chinguacousy.....	5.10	.....
	16th of March, 1921.....	Toronto.....	2.45	7.60
Perth.....	16th of December, 1920.....	Mitchell Town.....	.48	.48
Prince Edward.....	18th of May, 1921.....	Bloomfield Village.....	1.71	.....
	18th of May, 1921.....	Hallowell.....	7.79	.....
	18th of May, 1921.....	Sophasburg.....	4.95	.....
	18th of May, 1921.....	Ameliasburg.....	7.77	.....
	18th of May, 1921.....	Bay of Quinte.....	1.15	23.37
Renfrew.....	15th of June, 1921.....	McNab.....	13.14	.....
	15th of June, 1921.....	Horton.....	7.47	.....
	15th of June, 1921.....	Admaston.....	4.01	.....
	15th of June, 1921.....	Ross.....	15.56	.....
	15th of June, 1921.....	Westmeath.....	12.91	.....
	15th of June, 1921.....	Pembroke.....	5.47	58.56
Simcoe.....	18th of May, 1921.....	Bradford Village.....	1.15	1.15
Waterloo.....	27th of April, 1921.....	New Hamburg Village.....	.72	.72
Wellington.....	20th of July, 1921.....	Mount Forest.....	.68	.....
	27th of April, 1921.....	Eramosa.....	6.70	.....
	27th of April, 1921.....	Guelph.....	4.00	11.38
Wentworth.....	12th of January, 1921.....	Hamilton City.....	.10	.....
	12th of January, 1921.....	West Flamboro.....	.88	.....
	12th of January, 1921.....	East Flamboro.....	2.24	.....
	24th of August, 1921.....	Dundas Town.....	.47	3.69
York.....	16th of March, 1921.....	York.....	.30	.....
	16th of March, 1921.....	Etobicoke.....	2.41	.....
	14th of September, 1921.....	York.....	.25	.....
	14th of September, 1921.....	Scarborough.....	6.73	.....
	14th of January, 1921.....	North York.....	1.70	11.39
			Total	178.72



SYSTEM OF PROVINCIAL
HIGHWAYS
PROVINCE OF ONTARIO.
Assumed from Dec. 1st 1920 to Nov. 30th 1921.

MAP No. 1

Reversions from December 1st, 1920, to November 30th, 1921.

	Miles.	Miles.
Leeds County—S. Elmsley Township.....	3.5	
Lanark County—N. Elmsley Township.....	6.25	
		9.75
Carleton County—Huntley.....	6.6	
—Goulburn.....	.7	
		7.3
		17.05

The System of Provincial Highways as on November 30th, 1921, and including all roads assumed, is shown on Map No. 3.

Traffic development in the vicinity of all cities had brought such a load on older types of road surfaces that rebuilding and construction of satisfactory pavements was imperative. Plans were therefore prepared for the paving of sections of highway adjacent to cities and requiring urgent attention, so that by the close of the year the cities of Toronto, Hamilton, Ottawa, London, Belleville, Kingston, Sarnia, Windsor, Guelph, Stratford, Brantford and Chatham had each been provided with paved sections of Provincial Highways leading directly away from the end of city pavements.

In localities where stone could be conveniently obtained and where it was advisable to permit settlement of new roadway embankments, a type of road surface adaptable to such work was used and macadam base courses constructed. Upon these base courses, when properly packed by time and traffic, higher types of surfaces may be placed in the future as conditions warrant. In all almost 129 miles of base course was laid.

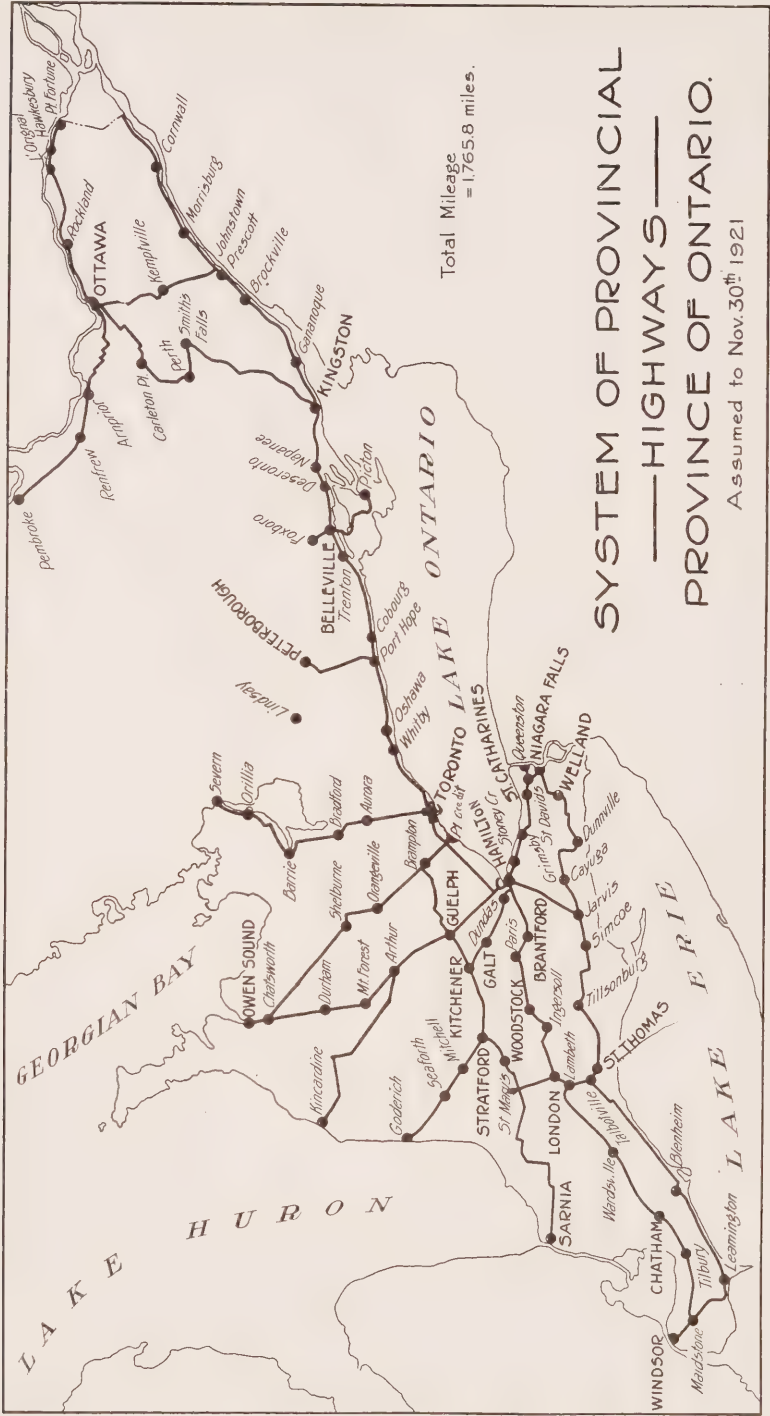
Gravel roads were maintained by dragging and the application of further light layers of gravel, and under this system about 526 miles were gravelled to provide the necessary material for smoothing out the surface.

The construction of the full width of travelled portion of roadway was proceeded with on portions requiring grading and ditching and this work resulted in the completion of subgrade on 351.41 miles of the system. Many narrow sections of highway were thus widened to full width, making the road safer for vehicular traffic.

A summary of work done in the various counties is as follows:

CONSTRUCTION COMPLETED ON PROVINCIAL HIGHWAYS, 1921

COUNTY.	Miles of Poles moved.	No. of Culverts	No. of Bridges	Grading	Miles of Graveling	Miles of W. B. Macadam Base	Miles of W. B. Macadam 2-Course	Miles of Bit. Macadam	Miles of Asphaltic Concrete.	Miles of Concrete Pavement	Ln. ft. of Guard Rail	Miles of Trees planted	Ln. ft. of Storm Sewers laid	Miles of Cobble Base	Miles of Surface Treatment	Miles of Gravel Rd. Mice.	Miles of Clay Road Mice.	Miles of Macadam Road Mice.	Miles of Sand Road Mice.	Miles of Old Fence moved back	Miles of New Fence erected	
Brant.....	8.5	7		10.7	0.7					6.9					4.3	14.4					7.0	7.0
*Brant and Oxford....	2.0	13		0.7	8.5											8.5					0.4	0.4
Bruce.....		8	2	1.3	19.3																	
Carleton.....	1.0	91	1	20.7	15.1	8.6	0.6		3.8		7,513	30.4			2.1	35.0	1.7	16.9			15.7	3.1
Dufferin.....		22		9.5	11.7											16.6					4.7	0.1
Dundas.....	3.5	10		4.3	0.5	4.0						1.7			5.0	8.0		7.5			0.8	
Durham.....	1.3	18		7.7	22.8						2,000	20.1			5.0	32.1					8.2	5.0
*Durham and North- umberland.....		15	1	3.5	3.5											8.3						
*Durham and Peter- borough.....		8		2.0	2.0											3.0						
Elgin.....		43		11.7	23.4						5,217					48.4					1.6	4.4
Essex.....		19		12.3	41.2					3.5						51.4					6.7	3.0
Frontenac.....	1.8	61		5.2	1.5		9.5					6.0			10.7	19.9		13.7			6.0	0.3
Glengarry.....		14		13.3	1.6	7.0						3.7		1.0	0.8	24.4	3.8	8.5			6.8	8.6
Grenville.....	11.0	36		5.0	1.4	8.9						58.0			5.0	24.4		7.2			7.8	1.7
Grey.....		13	1	0.7	2.8										0.5	53.5						0.7
Haldimand.....		137		14.7		11.4	0.1										6.5	24.0				
Halton.....		77	1	9.5	2.7	5.1																
Hastings.....		30	2	17.9	14.7	3.7	4.8						1,500		5.6	17.9		9.3			3.8	5.3
Huron.....		80		4.2	9.2											24.4					1.0	
Kent.....		24		10.4	37.0					0.7						56.3	30.2				0.9	
Lambton.....		39		2.2	29.1					2.4						31.6						
Lanark.....		4		0.4		0.4		0.9							4.0			36.2				
*Lanark and Carleton. Leeds.....	23.0	5		1.5		1.5															3.8	3.8
Lennox and Addin- gton.....		50		9.6	7.6	4.3		4.0			14.5				3.0	3.0		17.5			5.0	1.0
Lincoln.....	0.5		1	0.8		4.0	0.3					3.5			9.5			13.5			3.7	0.5
Middlesex.....		21		2.8		14.3		10.4			3,465	8.0			21.0			26.5				1.4
Norfolk.....	12.3	136	1	21.5	65.8					5.7	1,100				3.4	86.4					1.0	4.9
Northumberland.....		14		7.5	21.5								2,200			30.5						
Northumberland.....	2.1	14		7.7	15.9							15.0	1,615			39.9					20.9	10.0
Ontario.....		9	1	5.7	1.5	11.1	3.5		3.5		1,200	18.0			9.3	9.1		8.6			2.0	8.5
Oxford.....	0.6	31	1	7.1	9.8	2.3			0.4						2.0	0.8						
*Oxford and Middlesex.																						



REPORT OF DIVISION ENGINEERS, PROVINCIAL HIGHWAYS
EASTERN DIVISION

MR. W. A. McLEAN, M.E.I.C.,
Deputy Minister of Highways.

SIR:—

I beg herewith to transmit a report of the work done on the Provincial Highways in the Eastern Division for the year 1921.

I have the honour to be,

Sir,

Your obedient servant,

(Sgd.) A. A. SMITH.

OTTAWA-PORT FORTUNE HIGHWAY

From Ottawa easterly $3\frac{3}{4}$ miles, a 20 foot asphaltic concrete surface on a two-course water-bound macadam base was laid with standard ditches and entrance culverts and, with the exception of $\frac{1}{4}$ mile at Green's Creek, the remaining $3\frac{1}{2}$ miles into Orleans was ditched and entrances installed. Thirty-four concrete culverts were built, and approximately 12 miles of fences were moved back, completing 95 per cent. of the widening of this section.

From Orleans to Rockland, 9 miles, the bituminous penetration was completed, with the exception of about $\frac{1}{4}$ mile at Cardinal Creek, approximately 3 miles being laid this year. From a point about 1 mile west of Rockland westerly, 6 miles, the grading, ditching and farm entrances were completed and 15 concrete culverts constructed.

The fences on both sides of the road here, and for 1 mile just east of the Cumberland Township line, were moved back to the 86 foot line.

On the provincial highway within the town of Rockland, two concrete culverts were constructed and about $\frac{1}{5}$ of a mile of road surfaced with bituminous penetration, and ditched.

East of Rockland, in Clarence Township, 8 miles, 25 concrete culverts were constructed and about eleven miles of fence moved back to the 86 foot line. Also the bituminous penetration surface was continued from a point about $1\frac{1}{4}$ miles east of Rockland easterly 3 miles, graded to standard cross-section and farm entrances installed.

From the Clarence-North Plantagenet town line easterly to the east limits of Hawkesbury, 32 miles, the construction consisted of the building of 64 concrete culverts and one bridge at Wind Creek.

From Hawkesbury easterly, approximately 6 miles, fences on both sides of the road were moved back, and with the exception of $\frac{6}{10}$ of a mile east from Little Rideau River bridge, grading and ditching was completed and farm entrances installed.

From Bradford's Creek bridge westerly $1\frac{1}{4}$ miles the highway was fenced on both sides.

From the town of Hawkesbury easterly to the Quebec boundary, 46 concrete culverts were built.

General maintenance was carried on during the season over the whole highway from Ottawa to Pt. Fortune.

OTTAWA-PEMBROKE HIGHWAY

From Ottawa city limits to the C.P.R. crossing at Britannia, approximately $4\frac{1}{2}$ miles, the right-of-way was cleared and graded to standard cross-section, side entrance culverts installed and 12 concrete culverts built. A rubble foundation 6 inches deep and 20 feet wide was laid for a distance of $2\frac{1}{2}$ miles from Ottawa westerly, and $\frac{1}{2}$ mile of macadam roadway, 10 inches deep and 20 feet wide, constructed from the Richmond road westerly. Five miles of fence was taken down and 3 miles erected on the new limits of the right-of-way.

From the C.P.R. crossing at Britannia north-westerly $27\frac{3}{4}$ miles to Antrim, very little construction was carried out. Four-tenths of a mile at Carp and 1 mile from Marathon easterly along the Huntley-Fitzroy town line and south in Huntley Township was graded to standard and side entrances installed. The



OTTAWA-PEMBROKE PROVINCIAL HIGHWAY

View of Carillon Rapids on Ottawa River from Provincial Highway.

above grading was given a coat of gravel, 6 inches deep and 14 feet wide, and between Carp and Antrim 19 concrete culverts were built.

From Antrim to Arnprior, approximately 7 miles, the road was graded and ditched to standard cross-section, side entrance culverts installed, 11 concrete culverts built and the whole stretch given a 14 foot surface of gravel 6 inches deep. The old fence for a length of 2.8 miles was moved back to the new alignment.

West of Arnprior, for a distance of $\frac{1}{3}$ mile, the road was graded, farm entrances installed and a 5 inch water-bound macadam base, 20 feet wide, laid. The highway was graded through the cross road, Concession VII, McNab Township, for a distance of one mile and covered with a 6 inch coat of gravel 14 feet wide. Forty concrete culverts were built in McNab Township, and $5\frac{1}{3}$ miles of fencing erected.

From the McNab-Horton town line to Cobden, no construction was carried out except in the marsh south of Cobden, where a fill 30 feet wide for a distance of 4,000 feet was made and gravelled. From Cobden westerly $3\frac{1}{4}$ miles, the road was given a 4 inch coat of gravel 9 feet wide.

General patrol maintenance was carried on over the whole road.

OTTAWA-PRESCOTT HIGHWAY

The macadam surface was completed from Prescott to the G.T.R. crossing north of Johnstown by the construction of a base course, 8 inches deep and 20 feet wide, from the railway crossing southerly 1.4 miles. One-half mile from Prescott to Wexford was treated with tar. The guard rail at the G.T.R. level crossing, north of Johnstown, was moved back, the crossing improved and



OTTAWA-PRESCOTT PROVINCIAL HIGHWAY

Asphaltic concrete surface passing Dominion Experimental Farm, south of Ottawa.

the bridge at Johnstown completed. General maintenance was carried out over this area and over the gravel section north to Spencerville.

From Spencerville northerly to Bedell, 14 miles, the 20 foot gravel surface was renewed, and 12 culverts built.

Over the entire area from Prescott to the Rideau, scattered fencing and grading was done, and 51 miles of trees were planted.

In Edwardsburg Township, the widening was practically completed and in Oxford Township about 90 per cent. completed. As soon as the culverts were constructed, these points were graded, thereby completing the grading of the entire section except the approaches to the C.P.R. overhead crossing near Kemptville.

From the Rideau River northerly to the North Gower Township line, 1.8 miles, a gravel surface 20 feet wide was laid, and $1\frac{1}{5}$ mile graded. From the

town line northerly to North Gower Village, approximately 6 miles, the macadam base course was completed by the construction of 4.9 miles, 6 inches deep, 20 feet wide. Stephen's Creek bridge, started in 1920, was completed, and the road surface through the village of North Gower was oiled. The grading and widening from the Rideau River to North Gower Village was practically completed.

From North Gower Village to Hog's Back the grading was completed, about $\frac{1}{2}$ mile being done at Phalin's Hill and Stephen's Creek bridge in North Gower Township and $\frac{1}{5}$ mile at Black Rapids in Nepean Township. Three bridges at Watterson's Corners, Carsonby and North Gower, and two culverts, and two bridges at Jock River and Manotick, which were started in 1920, were completed.

One mile of cobble base was laid at Phalin's Hill and over this and northerly for a total distance of approximately 4 miles, gravelling 20 feet wide was done, joining up with the 20 foot gravel surface running south from Manotick. Through the village of Manotick the surface was oiled. Between the Jock River and Johnson's Hill, gravel was placed to give a 20 foot gravel surface from Manotick southerly to Merivale side road. From this point northerly to the junction of the Ottawa-Kingston road at Hog's Back, $5\frac{3}{4}$ miles, the macadam base course 6 inches deep and 20 feet wide was completed by the construction of 2.8 miles northerly from the Merivale side road. The fencing from North Gower Village to Hog's Back was about 90 per cent. completed. The grading was completed, 14 miles of trees planted and 7,513 feet of guard rail erected.

From Hog's Back to Ottawa, four culverts were built, completing the concrete work in this section.

From Johnston to Hog's Back the concrete work, grading and a macadam or gravel surface has been completed and the fencing over 90 per cent. complete. From Hog's Back to Ottawa construction was held up pending settlement with land owners.

The whole of the Ottawa-Prescott highway received continuous general maintenance by patrols.

JOHNSTOWN-QUEBEC BOUNDARY HIGHWAY

From the junction of the Ottawa-Prescott highway at Johnstown easterly 5.3 miles, to the beginning of the Dominion Government Canal road, a macadam base, 5 inches deep and 20 feet wide, was laid, except $\frac{1}{2}$ mile at Woodland's Quarry. The first $3\frac{1}{2}$ miles were oiled and the grading of the whole area completed by the construction of $1\frac{1}{2}$ miles of standard ditches at the east end of this section. From this point into Cardinal Village, $\frac{4}{5}$ of a mile, no work was done, this being Dominion Government Canal road.

In the east limits of the Village of Cardinal, $\frac{1}{3}$ of a mile of heavy grading was done; and $1\frac{1}{5}$ miles of macadam, 7 inches deep and 20 feet wide, was laid east of the village, completing the macadam surface from Cardinal to Iroquois, except those sections which are Dominion Government Canal road.

From the east limits of Iroquois easterly $3\frac{1}{4}$ miles to the proposed diversion at Flagg's Creek, a 5 inch water-bound macadam base, 14 feet wide, was laid and 2 concrete culverts constructed. The grading of the whole section from Iroquois to Morrisburg, except $\frac{1}{5}$ mile at the proposed Flagg's Creek diversion and one mile of Dominion Government Canal road in the east limits of Matilda Township, was completed, approximately $2\frac{1}{2}$ miles being done during the 1921 season. The new macadam east of Iroquois, $3\frac{1}{4}$ miles, and about $1\frac{3}{4}$ miles of the macadam built in 1920, west of Iroquois, was treated with tar.

From Morrisburg Village easterly to the Williamsburg-Osnabruck town line, about 7 miles, 2 miles of heavy grading and ditching, with standard entrance

culverts, was carried out. This work was in scattered sections and included grade reductions and backfilling over culverts; seven concrete culverts having been completed in this area during the season.

From the town line easterly to Farran's Point, $3\frac{1}{2}$ miles, approximately 1.8 miles of grading and ditching with standard farm entrances was done, and directly east of Farran's Point the same work was carried out for about $1\frac{1}{2}$ miles. Through Aultsville and Farran's Point, $2\frac{1}{2}$ miles of surface was treated with 50 per cent. asphaltic road oil and between Farran's Point and Dickenson's Landing, one concrete culvert was built.

East of Dickenson's Landing to the town line, the road was graded and ditched for a distance of 1.6 miles. This was given a 5 inch coat of gravel 20 feet wide to complete the gravel surface from Dickenson's Landing to Moulinette. Nine concrete culverts were constructed in this area.

Through the villages of Moulinette and Mille Roche the surface was treated with 50 per cent. asphaltic road oil.

From Maple Grove easterly $\frac{4}{10}$ of a mile of ditching and $\frac{7}{10}$ of a mile of macadam construction completed the grading, and a 2 course macadam roadway, 12 inches deep and 20 feet wide, to the west limits of Cornwall Town—approximately $3\frac{1}{4}$ miles was constructed. This surface was twice treated with tar during the season.

In the east end of Cornwall, $\frac{1}{4}$ of a mile of road was covered with a 10 foot strip of gravel 5 inches deep, and east of the town the highway was ditched for approximately 1 mile, completing the grading of the $2\frac{1}{4}$ mile macadam surface to the Cornwall-Charlottenburg town line. This macadam surface was treated with 50 per cent. asphaltic road oil.

Through Charlottenburg Township, $12\frac{1}{4}$ miles, scattered grading, surfacing, and culvert construction as follows was carried out.

From Lancaster Village easterly, 9 miles, to the Quebec boundary, the highway was graded to standard cross-section and side entrances installed. The 16 foot macadam base, which in 1920 was completed as far as the Bainsville side road, was this year extended easterly 2 miles, and from this point to the Provincial boundary, a 12 foot strip was laid. Five concrete culverts were constructed and 30 off-take ditches dug from the highway to Lake St. Francis. Three-quarters of a mile of road between Lancaster and South Lancaster was treated with tar.

GENERAL:

Continuous maintenance was carried on over the whole highway from Johnstown to the Quebec boundary wherever construction operations permitted.

Other construction as follows was done during the season:

EDWARDSBURG TWP.

Fencing—5.5 miles.

Tree planting—835 trees.

MATILDA TWP.

Fencing—0.7 miles.

Tree planting—235 trees.

WILLIAMSBURG TWP.

Fencing—40 rods.

Field stone piled—6,861 c.y.

OSNABRUCK TWP.

Fencing—3 miles.

Tree planting—298 trees.

Field stone piled—12,475 c.y.

CORNWALL TWP.

Fencing—1.5 miles.

Tree planting—73 trees.

Field stone piled—9,195 c.y.

CHARLOTTENBURG TWP.

Fencing—8.0 miles.

Tree planting—183 trees.

Field stone piled—8,000 c.y.

LANCASTER TWP.

Fencing—7.35 miles.

Tree planting—340 trees.

KINGSTON-PRESCOTT HIGHWAY

From Barriefield easterly to the Fingerboard, approximately $9\frac{1}{2}$ miles, a two-course water-bound macadam roadway, 8 inches deep and 20 feet wide, was constructed with standard ditches and farm entrances, and the first three miles east of Barriefield treated with tar. Five miles of the old fences were moved back to the 86 foot line, four miles of trees were planted, and 9 culverts were built.

From the Fingerboard to Gananoque, general patrol maintenance was carried out. Commencing at a point approximately 1 mile west of Pittsburg-Leeds Township line westerly $\frac{3}{4}$ of a mile, and from the township line easterly for a distance of 2 miles, a macadam base, 8 inches deep and 20 feet wide, was constructed. On the 2 miles east of the township the ditching was completed and trees planted and on the whole section from Barriefield to Gananoque about 16 miles of poles were moved.

Easterly from Gananoque through Leeds, Lansdowne and Escott townships to the Yonge Township boundary, approximately 18 miles, general maintenance was carried on. In Lansdowne Township, $4\frac{1}{2}$ miles of poles were moved and $\frac{1}{2}$ mile of trees planted. In Escott Township one culvert was constructed, one mile of fence moved back, $4\frac{1}{2}$ miles of trees planted and $4\frac{1}{2}$ miles of poles moved.

In Yonge Township, besides general macadam maintenance, 18 culverts were constructed, and two bridges, at Jones Creek and Michael Henry Creek, were completed. From Yonge's Mills easterly $2\frac{1}{2}$ miles heavy grading was completed, farm entrances installed, trees planted, and $\frac{1}{2}$ mile of macadam base, 4 inches deep and 10 feet wide, was constructed. Throughout the whole township, 6 miles of poles were moved off the highway entirely and 1 mile of new fence constructed.

From Yonge Township east boundary, easterly 1 mile, a macadam base course, 4 inches deep and 20 feet wide, was laid, and from Brockville easterly 4 miles, a bituminous penetration surface on a 5 inch water-bound macadam base was constructed. From Yonge township line to Brockville, the grading, ditching, farm entrances, fencing, tree-planting and pole-moving were completed.

From Brockville easterly, approximately $2\frac{1}{2}$ miles of macadam base, 6 inches deep and 20 feet wide, was laid, grading completed, farm entrances installed, and trees planted. The highway was widened to 86 feet from Brockville to Maitland, a distance of 3.7 miles. From this point easterly to Prescott, approximately 7 miles, 22 concrete culverts were built, $1\frac{1}{2}$ miles of old fence moved to the new line, 3 miles of grading and ditching done, and $\frac{1}{3}$ mile of macadam base 20 feet wide in the village of Maitland were constructed.

General maintenance was carried out over the whole road.

BELLEVILLE-KINGSTON HIGHWAY

From Belleville to Shannonville, a distance of 7 miles, a two-course, water-bound macadam roadway 20 feet wide was completed with standard ditches and farm entrances. Six concrete culverts were constructed in Thurlow Township, and about $4\frac{1}{2}$ miles were treated with tar. Five and three-quarter miles of the highway were widened to 86 feet.

The rock cut and bridge at Shannonville, which were started in 1920, were completed and the diversion opened to traffic.

From Shannonville to Marysville bridge the road was ditched and graded and standard entrance culverts installed. This newly graded section was immediately given a heavy coat of gravel 10 feet wide over the entire length, including the Shannonville diversion.

Marysville bridge, which was started in 1920, was completed and opened to traffic.

General patrol maintenance was carried out over the entire stretch of gravel road from Shannonville to the Slash road about $1\frac{1}{4}$ miles south of Marysville, a distance of $7\frac{3}{4}$ miles.

From the Slash road southerly 1.7 miles an 8 inch macadam base 20 feet wide was laid over the heavy grading done the previous year. From this point into Deseronto, 3.3 miles, maintenance was carried out and three concrete culverts were constructed, thereby completing the culverts on this section.

From Deseronto to Napanee, $3\frac{1}{2}$ miles of macadam base 20 feet wide were constructed, linking up with the macadam previously laid from Napanee westerly and completing a macadam surface from Deseronto to Napanee, a distance of $5\frac{1}{4}$ miles. The stone for this work had been quarried from Napanee Hill and piled by the road during the previous winter. The construction of $\frac{1}{2}$ mile of ditching completed the ditching of this section. The finished road from Napanee westerly 1.7 miles was treated with tar and general maintenance was carried on over the whole section.

Napanee Hill cut was completed, and a two-course water-bound macadam roadway laid through it.

From the east end of the cut easterly 5 miles to Lund's Quarry, the macadam surface was patched and treated with tar and general maintenance was carried on. Kayler's bridge was completed and opened to traffic.

The rock fill over the large culvert just east of the quarry was brought up to grade and a macadam surface laid over it. The 1.7 miles of macadam west of Odessa was treated with tar, two miles of the highway widened to 86 feet, and $\frac{3}{4}$ miles of trees planted.

From Nigger Hill (Kingston Township boundary) easterly $7\frac{3}{4}$ miles to Kingston, the macadam surface was treated with tar and general maintenance carried on by a patrol. A short length of ditching and tiling was done just west

of Kingston and $1\frac{3}{4}$ miles of highway widened to 86 feet, mainly between Kingston and Cataraqui.

Over the entire road continuous maintenance was carried out.

OSHAWA-BELLEVILLE HIGHWAY

From Oshawa to Port Hope, approximately $28\frac{1}{2}$ miles, gravelling 20 feet wide was carried out with the exception of about 1 mile in the town of Bowmanville, on which asphaltic concrete was laid. Of this 0.7 mile was laid by the town of Bowmanville, and the remainder by the Department. Thirteen concrete culverts were constructed, approximately $6\frac{1}{2}$ miles of scattered ditching completed, farm entrances installed and fourteen and a half miles widened to 86 feet. Some 2,000 feet of guard rail was erected at Roseberry and Rows hills and about 20 miles of trees planted throughout the section. From Oshawa to Harmony the gravel road was treated with asphaltic oil road.

From Port Hope to Belleville is approximately $50\frac{1}{2}$ miles. Of this $4\frac{1}{3}$ miles within the larger towns is not Provincial Highway. On the highway,



PORT HOPE-BELLEVILLE PROVINCIAL HIGHWAY
Gravel surface east of Colborne.

scattered gravelling was done where necessary, $25\frac{1}{2}$ miles being covered with a 4 inch coat, 20 feet wide. At various points throughout this area a total of $23\frac{1}{2}$ miles of road was widened to 86 feet, 10 miles of grading and ditching with farm entrances done, 2 miles of poles moved, 15 miles of trees planted, 11 culverts built and 3,115 feet of storm sewers laid.

Patrol maintenance was carried on over the whole road from Oshawa to Belleville.

BELLEVILLE-PICTON HIGHWAY

From Belleville southerly, approximately 6 miles, the surface was given a light coat of gravel.

From Mountain View to Pearsall's bridge the surface was maintained with broken stone. Three miles from Pearsall's bridge southerly, the macadam built the previous year by the County was given surface treatment with tar.

From Bloomfield to Picton the surface was maintained with gravel.

Considerable repairs were made to the floor of Belleville Bay bridge and over the whole road continuous patrol maintenance was carried on.

BELLEVILLE-FOXBORO HIGHWAY

From Belleville northerly for 3 miles the road was ditched and graded to standard cross-section and the necessary farm entrances installed. Two miles of this fresh grading was covered with a macadam base course, 20 feet wide, and, from Foxboro Village southerly one mile the old macadam surface was treated with tar. Over the whole length of the road, 15 concrete culverts were constructed during the season.

PORT HOPE-PETERBORO HIGHWAY

The road was graded and ditched, standard entrances installed and a 6 inch gravel surface, 20 feet wide, placed on the following sections:

- (a) Port Hope northerly—1.3 miles.
- (b) Hope-Hamilton town line— $1\frac{1}{4}$ miles.
- (c) South of Baileyboro— $\frac{1}{3}$ mile.
- (d) Between Centreville and Fraserville—approximately 2 miles.



TORONTO-PORT HOPE PROVINCIAL HIGHWAY
Gravel surface between Cobourg and Port Hope.

- (e) North and south of Kendry railway crossing—2 miles.
- (f) From Scott's Corners north-easterly— $2\frac{1}{5}$ miles.

From Peterboro south-westerly, 4.3 miles, a 6 inch water-bound macadam base 20 feet wide was laid with standard ditches and side entrances complete.

Over the whole road 54 concrete culverts were built and $1\frac{1}{5}$ miles of fence moved back to the 86 foot line.

General maintenance, consisting of patching, dragging, weed-cutting, cleaning ditches and culverts and removing snow, was carried on continuously over the whole road by a patrol gang.

OTTAWA-KINGSTON HIGHWAY

From a point about 3 miles east of Ashton, easterly for 1 mile, the road was graded, standard entrances installed, and a cobble base 18 feet wide with a gravel surface laid. Eleven concrete culverts were built in Goulburn Township, and the whole road from Ottawa to Ashton was cleared of weeds and brush, and the surface kept in repair by patching and dragging.

From Ashton to Ashton Station, 1.5 miles, the road was graded, standard entrances installed, a macadam surface laid, 5 concrete culverts built, and the right-of-way widened to 86 feet.

From Ashton Station to Perth the right-of-way was cleared of weeds and brush, and the surface maintained by patching and dragging. At Boyd's Corners, a diversion, 1700 feet long, to improve the alignment, was graded and 4 concrete culverts built.

From Perth to Smith's Falls is $11\frac{1}{4}$ miles. From Perth south-easterly, $2\frac{3}{4}$ miles of road was cleared and widened to 86 feet, and, south-east of Port Elmsley, three-quarters of a mile of penetration surface was completed. Maintenance of this section required heavy patching with tar.

From Smith's Falls to Morton, $30\frac{3}{4}$ miles, heavy maintenance was carried on, a temporary 18-inch tile culvert was placed across the road in the swamp just west of Portland, and $\frac{1}{2}$ mile of road ditched at this point. Scattered sections in this area were given a 3 inch coat of gravel 10 feet wide as follows:

- (a) Lombardy north-easterly $2\frac{1}{4}$ miles.
- (b) Between Lombardy and the Kitley—S. Elmsley town line— $\frac{1}{2}$ mile.
- (c) At New Boyne— $\frac{1}{2}$ mile.
- (d) North-east of Portland—1 mile.
- (e) Through the swamp south-west of Portland—2 miles.
- (f) Seven and a half miles north-east of Elgin— $\frac{1}{2}$ mile.
- (g) Elgin— $\frac{1}{3}$ mile.

From Morton to Joyceville, $24\frac{1}{2}$ miles, 48 concrete culverts were constructed and heavy maintenance carried on. Three scattered sections as follows were given a gravel surface 10 feet wide and 3 inches deep.

- (a) West of the Lyndhurst road— $\frac{1}{2}$ mile.
- (b) From $2\frac{1}{2}$ miles west of Seeley's Bay westerly—1 mile.
- (c) From 5 miles west of Seeley's Bay westerly— $\frac{1}{2}$ mile.

From Joyceville westerly 6 miles no construction work was undertaken, but continuous maintenance was carried on. From this point to Barriefield, 26 concrete culverts were constructed and the road patched with broken stone.

TORONTO-OSHAWA HIGHWAY

From Toronto to West Hill, approximately $8\frac{1}{2}$ miles, general macadam maintenance was carried out, the section from the G.T.R. crossing to West Hill being twice treated with tar during the season.

From West Hill easterly 1.4 miles of road were gravelled and from the eastern end of the proposed Highland Creek diversion easterly, approximately $1\frac{1}{2}$ miles, to the Pickering Township line was graded, five concrete culverts constructed and about $\frac{1}{2}$ mile of the highway widened to 86 feet.

From the township boundary to Dunbarton, about 3 miles, the macadam base 6 inches deep and 22 feet wide was completed, and two concrete culverts constructed in the vicinity of the Rouge. From the end of this macadam easterly $3\frac{1}{2}$ miles of asphaltic concrete surface 22 feet wide on a 9 inch water-bound macadam base were constructed, linking up with the asphaltic concrete laid in 1920 from Dunbarton to Pickering Village.

From Pickering Village to Whitby Township boundary, approximately $3\frac{1}{2}$ miles, the 6 inch macadam base, 22 feet wide, was completed and this whole

section treated with tar. Trees were planted along the road within Pickering Township; five miles of the highway were widened to 86 feet and about 1,200 feet of guard rail erected.

From the west limits of West Whitby to Oshawa, except about a mile in Whitby Town, a 6 inch water-bound macadam base, 22 feet wide, with standard ditches and farm entrances, was completed. On the mile in Whitby Town, mentioned above, 0.6 mile was constructed by the Town, and the remainder by the Department.

WESTERN DIVISION.

MR. W. A. McLEAN, M.E.I.C.,
Deputy Minister of Highways.

SIR:—

I beg herewith to transmit a report of the work done on the Provincial Highways in the Western Division for the year 1921.

I have the honour to be,
Sir,

Your obedient servant,
(Sgd.) G. F. HANNING.



HAMILTON-LONDON PROVINCIAL HIGHWAY

Steam shovel excavating for subway under Toronto-Hamilton and Brantford Railway.

HAMILTON-LONDON HIGHWAY

Between Hamilton and Brantford fencing, grading and concrete culverts are completed with the exception of about six miles of fencing in Ancaster township and 3 10 miles of grading at Binkley's subway. A macadam base

22 feet wide was constructed easterly from the Ancaster quarry 1.2 miles, to connect with the bituminous pavement constructed the previous year, and a second base course 5 inches thick and about 1.9 miles in length was laid in Ancaster village. The existing macadam base, 10 feet wide and 5 miles in length, west of Ancaster was widened to 22 feet and a new macadam base 22 feet wide was constructed westerly from the end of this macadam to the Brant-Wentworth county line.

For a distance of five miles from the Brant-Wentworth county line to Cainsville a 20 foot concrete pavement was constructed. This pavement connects with a stretch of about one-quarter of a mile of similar pavement which was laid the previous year.

From Cainsville to the easterly limits of the city of Brantford a 30 foot concrete pavement with curb and gutter and storm sewers which was commenced in 1920 was completed. The tracks of the Brantford Municipal Railway between the easterly limits of Brantford and the Mohawk Park entrance were moved to the south side of the road to provide clearance for the 30 foot pavement.



HAMILTON-LONDON PROVINCIAL HIGHWAY

Gravel surface and standard concrete culverts near Paris.

About three miles west of Brantford grading and fencing was done by day labour during the winter months over about 1 5 of a mile. The existing gravel road was maintained by dragging and patching. Culverts were cleaned out and oil applied to about four miles of road.

Between Paris and Woodstock 6.9 miles of road was graded and brought to standard cross-section, which completed the grading on this section. Twenty-six culverts were built and the right-of-way was widened to 86 feet for 3.7 miles westerly from Paris and for short distances at three other points between Paris and Woodstock, totalling in all about 6.5 miles of widening. A coat of gravel was applied from Paris westerly for a distance of 11 miles. Two and one-quarter miles of macadam was laid through swampy ground in the vicinity of Eastwood, linking up with the old macadam road which extends easterly from Woodstock a distance of 3 miles. This old macadam road was scarified and rolled. Trees were prepared for planting in Burford and Blenheim Townships.

Between Woodstock and Ingersoll 1 10 of a mile of heavy grading was done and 10 concrete culverts constructed. Three and a half miles of road was lightly gravelled.

Between Ingersoll and London 18 concrete culverts were constructed. The road was graded and brought to standard cross-section from Ingersoll and Thamesford, a distance of 4.8 miles. This includes $\frac{1}{10}$ of a mile of heavy grading at Thamesford. From Ingersoll westerly for a distance of $2\frac{1}{2}$ miles, the right-of-way was widened to 86 feet. The Thamesford bridge was completed and opened to traffic.

Four-tenths of a mile of gravel asphalt was laid in Thamesford village and a second coat of gravel was applied over the remainder of the road between Ingersoll and London, approximately 15.4 miles. Four hundred lineal feet of guard rail was erected.

Patrol maintenance was carried on over the entire road, including dragging and patching and cleaning of ditches and culverts. The injurious effects of springs in the roadway were overcome by undertiling. Some 250 yards of road was undertiled for this reason.



LONDON-ST. THOMAS PROVINCIAL HIGHWAY
Concrete pavement constructed during 1921.

LONDON-ST. THOMAS HIGHWAY

From the City of London southerly to the southerly limits of Lambeth Village, a distance of $5\frac{1}{2}$ miles, grading and culverts were completed and a concrete pavement 20 feet wide constructed. Two thousand two hundred lineal feet of storm sewer was laid by day labour and 14 catch basins constructed. From Lambeth to St. Thomas, a distance of $9\frac{1}{2}$ miles, the road was gravelled. One hundred and thirty-two lineal feet of guard rail was erected.

Weeds were cut and the road kept in repair by dragging and patching. One mile of road in Lambeth village was treated with oil.

LAMBETH-MAIDSTONE HIGHWAY

The road was graded and brought to standard cross-section and a concrete pavement constructed for a distance of 1,011 lineal feet westerly from Lambeth.

From the end of this concrete to Wardsville, a distance of approximately 31 miles, is a gravel road. Scattered construction work was done on this section during the 1921 season. About $\frac{3}{4}$ of a mile was graded and brought to standard cross-section just east of Delaware village and the approaches to Delaware

bridge and those to the bridge $1\frac{1}{2}$ miles west of Melbourne were widened. From the end of the concrete at Lambeth to the easterly limits of Christina village, a distance of 11 miles, the road was resurfaced with gravel; from the westerly limits of Christina village westerly $1\frac{1}{2}$ miles, and from 2 miles west of Melbourne westerly to Wardsville, 13 miles. Weeds were cut and guard rail repaired. About $1\frac{1}{2}$ miles of road in Melbourne village was treated with oil. The road was dragged and patched where necessary over the whole of this section.

From Wardsville to the city of Chatham, a distance of approximately 29 miles, was for the most part a sand and clay road, with gravel in Wardsville village and westerly $5\frac{1}{2}$ miles; easterly from Thamesville 1.4 miles, and easterly from the east limit of Camden Township $1\frac{1}{2}$ miles. Some nine stretches of road varying in length from $\frac{1}{2}$ mile to 2.3 miles were graded to standard cross-section. This includes 0.7 miles of grading for concrete pavement east of Chatham. Nineteen culverts were constructed and about 0.4 miles of fence moved back to the 86-foot line on the north side of the road in Zone Township. The road was newly gravelled through Wardsville village and westerly for a total distance of 6.7 miles, from Thamesville easterly 1.7 miles, from Thamesville westerly 1.4 miles, and from the westerly limits of Camden Township, easterly 1.5 miles. Construction of the concrete pavement, extending easterly from Chatham 2 miles, was started at the easterly end and completed for a distance of 3,600 lineal feet towards Chatham. Patrol maintenance was carried on over the whole of this section. The road was dragged and patched where necessary. Weeds were cut, and culverts and bridges repaired.

From the city of Chatham to Maidstone, a distance of approximately 40 miles, was practically all clay road with the exception of about 3 miles of gravel in Maidstone township. The road was graded to standard cross-section in Tilbury town and westerly, a distance of $\frac{3}{4}$ miles, and for a length of about $\frac{1}{2}$ of a mile, 2 miles east of Tilbury. The fences on the north side of the road were moved back to the 86 foot line over this half mile. Ten concrete culverts were constructed, $\frac{3}{4}$ mile of concrete pavement was laid in Tilbury town and westerly. The road was gravelled from Tilbury town easterly 1 mile, from Big Creek to the town line of Tilbury north and Tilbury west, a distance of 2 miles; from the village of Comber westerly to the village of Woodslee, a distance of $9\frac{1}{2}$ miles, and from Maidstone easterly 3 miles.

The department paid a part share of the cost of construction of the Tracey drain in Rochester township.

The road was dragged and patched, weeds were cut and general maintenance carried on over the whole section.

ST. THOMAS-WINDSOR HIGHWAY

The road was gravelled from Talbotville to Shedden, a distance of $6\frac{1}{2}$ miles. The rest of the road in Southwold and Dunwich townships was a fair gravel road. Heavy grading was commenced with a steam shovel in Dunwich township but was not completed. The road in Aldborough township was in very poor condition, being very light sand with $\frac{1}{2}$ mile gravelled. Two steam shovels were used for heavy grading and the entire stretch of $10\frac{1}{2}$ miles was graded to standard cross-section and surfaced with gravel. Forty-one culverts were built. A gravel hoist was erected on the lake shore as no pit gravel was available.

With the exception of gravelling, practically no construction work was undertaken between the westerly limit of Aldborough township, which is the

boundary between Kent and Elgin counties, and the village of Wheatley, a distance of approximately 50 miles, as the surface was gravel and in very good condition. Sections of the road were surfaced with gravel as follows: From Clearville westerly 1.8 miles; 2 miles through Palmyra and westerly; east of Morpeth, 1 mile; Morpeth westerly, 4.8 miles; easterly from Blenheim, 3 miles; westerly from Blenheim, $14\frac{1}{2}$ miles; east and west of Coatsworth side-road, a total distance of 3.4 miles; and easterly from Wheatley about 2 miles.

From Wheatley to Leamington, a distance of 6.7 miles, the road was graded to standard cross-section, a light coat of gravel applied, and seven concrete culverts were built. The road was gravelled from Leamington to Essex, a distance of 14.8 miles, and from Essex westerly 7 miles to the Pere Marquette railway crossing at Oldcastle. The old fence between lot 288 Maidstone township and the Sandwich south town line was taken down and moved back and a portion re-erected on the new right-of-way line.

A concrete pavement was constructed from Oldcastle westerly 2.7 miles. Part of the grading was done on this section. From the end of this concrete pavement to Windsor, a distance of 4 miles, the road was graded to standard cross-section. This includes the new grade across the Neal farm cut off. New fences were erected on the 86 foot line across the Neal farm. Twelve culverts were constructed between Oldcastle and Windsor.

General maintenance was carried on over the entire road. The surface was dragged and patched, weeds were cut and culverts were cleaned and repaired.

NIAGARA FALLS-ST. THOMAS HIGHWAY

The road between Niagara Falls and Welland, a distance of approximately $12\frac{1}{2}$ miles, is an old macadam road. Thirteen concrete culverts were built on the section, the road was graded to standard cross-section for four miles northerly from Welland and surfaced with stone to a width of from 10 to 16 feet, from Welland northerly and easterly $11\frac{1}{2}$ miles. Sixty-one concrete culverts were constructed between Welland and Dunnville.

From Dunnville westerly the road was graded to standard cross-section for a distance of 8.8 miles. Thirty-five culverts were built between Dunnville and Cayuga, and a macadam road was constructed from Dunnville westerly 9 miles, and from Cayuga easterly two miles. This completes the grading, culverts and macadam between Dunnville and Cayuga. From Cayuga to the east limit of Walpole township, a distance of 5.8 miles, is an old macadam road. A clay road extends through Walpole township, a distance of 6.6 miles, with about 1.2 miles of old macadam extending easterly from Jarvis which connects with a concrete pavement in the village of Jarvis. Thirty-six culverts were constructed between Cayuga and Jarvis and the road was graded to standard cross-section from Jarvis easterly four miles.

From Jarvis to Tillsonburg is for the most part a sand and clay road with stretches of gravel in Delhi and Courtland villages and westerly from Courtland $2\frac{1}{2}$ miles. Extending easterly from Tillsonburg is about $\frac{1}{2}$ mile of gravel, $\frac{1}{2}$ mile of tar macadam and $\frac{1}{2}$ mile of macadam base. Four concrete culverts were built in Walpole township just west of the village of Jarvis. The road was graded to standard cross-section from Jarvis westerly 1 mile, from Black Creek easterly 1.2 miles and westerly 3 miles including about 1.3 miles of heavy grading. A gap of 3 10 of a mile was left at Black Creek. About 3 miles of grading was done easterly from Courtland village.

A coat of gravel was applied to the newly graded sections east and west of

Black Creek and east of Courtland and also from Delhi easterly 1 mile and from Simcoe westerly 7 miles. Some 1913 rods of fencing was done.

Between Tillsonburg and St. Thomas two culverts were constructed. One-half of a mile of heavy grading was done at Springer Hill in Bayham township, and grading was commenced in Yarmouth township, but not completed. Gravel was applied to the fresh grade at Springer Hill and easterly from St. Thomas 8 miles. The right-of-way was widened to 86 feet for a distance of 0.3 miles at Springer Hill and 2,412 lineal feet of guard rail was erected.

General patrol maintenance was carried on over the entire road. The road was dragged and patched, and washouts and culverts repaired. Weeds were cut and ditches cleaned. The old macadam road extending 1 mile westerly from Aylmer and also from the Moulton-Wainfleet township line easterly for 8 miles was oiled.

HAMILTON-JARVIS HIGHWAY

This is an old macadam road throughout, approximately 25 miles, excluding those portions in the towns of Caledonia and Hagersville. The road was graded to standard cross-section from Hamilton southerly 3.8 miles, and a macadam base constructed over the same distance. Seventy culverts were constructed, which practically completes the culverts on this section.

The road was patched with stone. Ditches were cleaned, weeds cut and bridges repaired. The road was treated with oil between Mount Hope and North Glanford, a distance of 2 miles.

HAMILTON-QUEENSTON HIGHWAY

Grading and culverts were completed between Hamilton and Grimsby. The road was gravelled from Hamilton city-limits easterly to the junction of



HAMILTON-QUEENSTON PROVINCIAL HIGHWAY

A scenic stretch of road at Jordan.



HAMILTON-QUEENSTON PROVINCIAL HIGHWAY

View from Provincial Highway looking up 20-mile Creek at Jordan.

the Stoney Creek road at mile 5. A waterbound macadam base was constructed from mile 5 to Winona, a distance of 4 miles, and a bituminous macadam surface, which was commenced in 1920, was completed from Winona to Grimsby with the exception of about $\frac{1}{2}$ mile where a macadam base was constructed. The tracks of the Hamilton, Grimsby and Beamsville Electric Railway at mile 5 were moved to a new location to provide a better crossing of the road, and two level crossings were eliminated west of Grimsby by the relocation of one mile of track on the south side of the road. Some 180 rods of fencing was done in Saltfleet Township.

Between Grimsby and Beamsville two concrete culverts were constructed and the road was graded to standard cross-section from Beamsville westerly $\frac{3}{4}$ mile, completing the grading on this section. A macadam base was constructed easterly from Grimsby to Grimsby Park road, a distance of 1.3 miles and westerly from Beamsville $\frac{3}{4}$ mile.

A bituminous macadam surface was constructed from Grimsby Park road to Beamsville, a distance of 3 miles with the exception of about 0.4 miles at the "Thirty Mile" Creek.

Between Beamsville and St. Catharines six concrete culverts were constructed. The road was graded to standard cross-section at the "Fifteen" and "Sixteen" Mile Creeks where some heavy cutting was made. This completes the grading between Beamsville and St. Catharines with the exception of a short stretch where a diversion is to be constructed at Jordan Corner, in order to improve the turn at this point. One-third of a mile of bituminous surface was constructed easterly from Beamsville, which provides an improved surface from Beamsville to inland, a distance of $3\frac{1}{2}$ miles. Between Jordan and St. Catharines a macadam base was completed, about 3.2 miles being constructed this season, and a bituminous surface was constructed over the whole distance, approximately 5.3 miles. This provides an improved surface between Beamsville and St. Catharines with the exception of the short stretch at Jordan. Three thousand four hundred lineal feet of guard rail was erected between Beamsville and St. Catharines.

arines at fills requiring same, and 450 rods of fence was moved back. Trees were planted over three miles of right-of-way in Louth Township.

From Homer to St. David's, a length of approximately 4 miles, a macadam base was constructed and seven concrete culverts were built. Sixty-six lineal feet of guard rail were erected and 2 miles of trees were planted.

The entire road was under patrol maintenance, the sections having a macadam surface receiving, in addition to the regular maintenance, two applications of oil.

ST. DAVID'S-NIAGARA FALLS HIGHWAY

Ditches were constructed at St. David's corner and heavy grading was done on the St. David's ravine hill to the Stamford-Niagara line. The grades were reduced and the road widened. Eleven concrete culverts were built. A macadam base was constructed from St. David's to Niagara Falls, a distance of about 4 miles, with the exception of about $\frac{1}{2}$ mile at the St. David's ravine hill where the heavy grading was done, and about $\frac{1}{4}$ of a mile in Stamford village which was paved with concrete before the road was taken over by the Department.

The road was patched and oiled, small sections of concrete pavement repaired, and ditches and culverts cleaned.

NORTHERN DIVISION.

MR. W. A. McLEAN, M.E.I.C.,
Deputy Minister of Highways.

Sir:—

I beg herewith to transmit a report of the work done on the Provincial Highways in the Northern Division for the year 1921.

I have the honour to be, Sir,

Your obedient servant,

(Sgd.) R. M. SMITH.

TORONTO-SEVERN HIGHWAY

The Toronto suburban area extends northerly along Yonge street to the Holland river. In York township no construction was done in 1921, the road was maintained, however, by placing stone on the edges of the present pavement where traffic had undermined and broken away the existing surface. Holes in the pavement were patched with stone and tar. The whole was then treated with tar and a cover of $\frac{3}{8}$ inch stone. Minor repairs were made to bridges and culverts. Surveys were made in the township, including the proposed site for the high level bridge across the Don Valley.

Through the townships of Markham and Vaughan maintenance of a similar nature was done. Stone was shipped in and piled for patching.

In the townships of King and Whitechurch, from Eagle street, Newmarket, to township boundary, approximately $\frac{5}{8}$ of a mile, bituminous macadam



TORONTO-SEVERN PROVINCIAL HIGHWAY

View of Lake Couchiching from Provincial Highway north of Orillia.

surface was completed. Side entrances were completed by day labour. From South Town Line to Aurora the road was kept in shape by maintenance patrols.

Between the north boundary of King and Whitechurch townships to the top of Holland Landing hill, 1.95 miles, tar penetration pavement was completed under contract, the grading and side entrances being done by day labour. Stone 4 inches deep was applied on the Holland Landing hill.

Between King Township line and the Holland River crushed stone was placed for a base course over a distance of about $\frac{1}{2}$ mile. This work was continued from Holland River to Bradford.

From a point about $1\frac{1}{2}$ miles north of Bradford to the north boundary of West Gwillimbury township, a distance of $5\frac{1}{2}$ miles, macadam base was laid. Grading was done and side entrances installed throughout this section. Eighteen culverts were built. Considerable maintenance was required on the old gravel road adjacent to this new macadam to keep it in shape for the heavy traffic. Through the township of Innisfil 20 culverts were built. The road had been in very rough condition and required a considerable quantity of gravelling to put it in good shape. Ditches were opened up, and several tile entrances installed to prevent washing out of the road.

At Barrie the province has assumed 0.4 miles inside the town limits at the south entrance and 1.6 miles at the north entrance. At the south entrance one culvert was built and at the north 1.9 miles of grading was completed, and this grade received an application of gravel. Three culverts were also built within the north town limits. From Barrie limits to Crown Hill 1.7 miles were graded to standard section and then gravelled. In Oro Township grading was done from concession 10 to the north town line, a distance of 6.3 miles. This included one bad hill where grade was reduced from ten per cent. to seven per cent. Eleven culverts were constructed within this section and gravel applied. Gravel was also applied on the old road in concessions 2 to 6 and some entrance tile installed where grading was completed.

In the township of South Orillia, from south boundary 2.2 miles north, the grade was reduced on numerous small hills and the road gravelled. From Orillia Asylum entrance to the Barrie road, a distance of nearly 1 mile, a diversion was

constructed in order to provide a better approach to the town. The diversion being on low ground, two light coats of gravel were placed on this new grade.

Between Orillia and the north boundary of the township 0.7 miles were graded by day labour. Field stone was crushed and a macadam road built. Eighteen culverts were built in the township of South Orillia. From the south town line, township of North Orillia, to village of Ardtrea, 1.8 miles, were graded to standard section. Field stone was crushed and a macadam road built on this section. From Ardtrea to Washago the stone road was kept dragged and patched where necessary with 1 inch stone and screenings. North of Washago rock grading was done for a distance of 0.2 miles and the old macadam road maintained by gravel application to the Severn River.

BRAMPTON-STRATFORD HIGHWAY

From Brampton to Georgetown, a distance of 8.0 miles, the highway was gravelled and kept in good shape by dragging, making a great improvement in the surface. Some light ditching was also carried out to assist drainage. The road from Georgetown to Acton has not been assumed, due to the fact that several diversions are contemplated for work in 1922, but maintenance was carried out from Acton to the eastern limits of Guelph township. From this point to Guelph city, a distance of $2\frac{3}{4}$ miles, the road was graded a short distance immediately east of the city limits and loose stone was laid on approximately $1\frac{1}{2}$ miles and the remainder of this section was gravelled.

Westerly from Guelph the road was gravelled in stretches where the surface required such treatment. Continuing westerly to Breslau, the highway was lightly gravelled and reshaped and between Breslau and Kitchener, approximately three miles were resurfaced with gravel. Practically all the necessary culverts were constructed from Guelph to Kitchener, preparatory for the grading operations planned for next season.

From Kitchener westerly maintenance by dragging and patching with gravel was carried out. The section of the road through the villages of Baden and New Hamburg were maintained by applications of asphalt and tar. Light grading and ditching was done in several localities, and from a point about $3\frac{1}{2}$ miles east of Stratford to the city limits the road was gravelled, right-of-way cleared of brush, and roadbed widened on the dangerous sections, making a marked improvement in the approach to the city.

HAMILTON-CHATSWORTH HIGHWAY

The three high-level bridges at the Hamilton entrance were completed and the grading for the approaches to these bridges undertaken. Good progress was made on the large rock cut at Clappison's Corners. A macadam base was constructed from Clappison's Corners north 3 miles and the road was gravelled from the end of this macadam to the village of Puslinch. The culverts on this section were practically completed. In the township of Puslinch the road was maintained by re-surfacing and patching with gravel for a distance of 5 miles. The stretches of road through the villages of Puslinch, Morriston and Aberfoyle were oiled. The road was graded and surfaced with concrete pavement for a distance of 3.6 miles immediately south of the city of Guelph, culverts constructed and standard ditches built. A storm drainage system of approximately 5,000 feet was also installed on the Ontario Agricultural College hill.



Highway between Fergus and Huron
Crossing near Spring 20 feet deep, south of Fergus.

Northerly from Guelph, the road was gravelled a distance of 12 miles to the village of Fergus, and the road kept by road continued to Innesville. About 1 mile north of Fergus the road was graded and divided a distance of 1 mile, and kept for a distance of 1 mile immediately north of the Peel-Welland boundary. The section from Arthur south 3 miles was graded and divided and 2-2 miles of this piece was lightly surfaced with crushed stone. Through the township of Arthur the road was improved. About 14 miles in this township was gravelled and the remainder kept in good shape by dragging and patching with gravel. Midway between Mount Forest and Durham, at the line crossing, grading was completed and the right-of-way widened to 84 feet. About 14 miles of the road was gravelled and the surface kept in good shape by dragging and patching. The approach to the town of Durham was gravelled and north of the town the road was also gravelled and carted for a short distance. North of Durham, through the townships of Huron and Galloway, the road was kept in good shape by dragging and patching with gravel. Thirteen culverts were constructed and a small bridge spanned the river Sny. Through the village of Durand the road was divided and approximately two miles of stone was installed. General maintenance was kept throughout. A drainage ditch south of Chatham was raised and the road through the village was carted with gravel and then rolled.

STRATFORD-GODERICH HIGHWAY

From Stratford westerly, 3.82 miles of asphaltic concrete pavement were constructed. From the end of this pavement westerly, a distance of two miles, a macadam base was laid and surface treated with tar. From this point to Mitchell the road was scarified and reshaped. A new steel bridge at Sebringville, 60 ft. span, replaced the old wooden structure at this point, and at Whirl Creek the old steel structure was also replaced by a new 70 foot steel span.

West of Mitchell the road received a light coat of gravel, and this type of maintenance was continued as far as Holmesville. In the town of Seaforth some ditching was carried out, side entrance culverts installed and gravel applied. Some widening was also done by day labour, in short stretches where the highway was narrow and dangerous or where drainage was poor. Heavy grading was done between Holmesville and Taylor's Corners, a distance of 3.69 miles. All the culverts between Stratford and Goderich were completed.

STRATFORD-LONDON HIGHWAY

During the season 1921, the road received a 3 inch coat of gravel from Stratford south-westerly a distance of 9.6 miles. On this section, some $3\frac{1}{2}$ miles was graded and ditched. Westerly from St. Mary's, the road was also gravelled, and grading and ditching was done from the north-east corner of London township to Elginfield, a distance of 6 miles.

Southerly from Elginfield, short stretches of the road were graded and ditched and generally maintained by patching with gravel. The suburban area of London extends northerly from that city a distance of $5\frac{1}{4}$ miles. On this section of road, ditches were laid out and grades set preparatory to the ditching widening of the roadbed. From the Thames River, northerly to the middle concession IV, side ditches were constructed and the roadbed widened. Two light coats of gravel were applied from the city line to a point near St. Johns. Some work was also done on the abutments for the proposed new bridge over the Thames River at London. Most of the culverts were constructed between London and St. Johns, also between Elginfield and St. Marys, and one bridge of 50 feet span with 24 foot roadway over Fish Creek.

ELGINFIELD-SARNIA HIGHWAY

From Elginfield westerly for about 3.0 miles the road was graded and ditched. From Ailsa Craig westerly to Arkona very little construction was done. About $1\frac{1}{2}$ miles of the highway was gravelled in the township of E. Williams and a further 6.0 miles gravelled in the township of W. Williams. Passing into the county of Lambton at the Aux Sables River, culvert construction was undertaken and all structures completed to the village of Arkona, preparatory to 1922 grading.

Through the township of Warwick, a distance of approximately 14 miles, the road received a light gravel application. About $2\frac{1}{2}$ miles in Plympton township was graded and ditched and 11 miles gravelled.

From the east boundary of Sarnia township, the highway received a light coat of gravel. Westerly for $2\frac{1}{2}$ miles from the Sarnia city limits, a concrete pavement was constructed. The pavement is 18 feet wide with 6 foot gravel shoulders on each side. Side ditches were opened and culverts constructed. The work done on this section of road has greatly improved the approach to the city. On the above section practically all culverts were completed between Elginfield and Arkona.

TORONTO-HAMILTON HIGHWAY**(Via Dundas St.)**

Commencing at junction of Bloor Street and Mossom Road, grading was completed as far west as Dundas Street, a distance of 2.0 miles. Culverts were also constructed and one concrete bridge, 50 foot span, with 24 foot roadway, was constructed over Mimico Creek. Westerly to Summerville, the bituminous concrete surface was repaired by patching. The road was graded and surfaced (concrete base with asphaltic top) from Summerville to Cooksville, a distance of 3 miles.

From Cooksville westerly for $\frac{3}{4}$ of a mile the grading and ditching was done, and an asphaltic concrete pavement on 5 inch concrete base continued. Between Cooksville and 16-Mile Creek the road was generally maintained and 42 culverts built. The bridge at 16-Mile Creek was completed and opened for traffic. Grading was completed from 16-Mile Creek westerly to Clappison's Corners, and all necessary culverts constructed. A 5 inch macadam base was laid from the eastern boundary of Nelson township to the east side of Nelson Mountain Cut.

Westerly through the township of E. Flamboro to Clappison's Corners, a distance of $3\frac{3}{4}$ miles, the grading was completed. Culverts were also constructed across the township, and a macadam base laid through Waterdown village and westerly one mile towards Clappison's Corners.

From Clappison's Corners the highway runs south-easterly along the boundary between E. and W. Flamboro townships, a distance of approximately 1.6 miles, where it forks, one route running south-westerly into Hamilton, and the other easterly to connect with the Toronto-Hamilton highway. These roads, together with the three high-level bridges which were completed in 1921, are known as the Hamilton Entrance Scheme. Good progress was made with the large rock cut at Clappison's and grading and approaches to these bridges. The necessary culverts were also completed. Some grading was done in preparation for the surfacing contemplated for next year's programme.

HAMILTON-KITCHENER HIGHWAY

The suburban area of the city of Hamilton extends from Dundas Forks (Binkley's Corners) to Christie's Corners (excluding the town of Dundas), a distance of 4.5 miles. During the season of 1921, in Ancaster township between Binkley's Hollow and Dundas, a large culvert 12 feet by 8 feet by 161 feet was started and the Hollow was surfaced with crushed stone. Approximately 3.0 miles of ditching was done and two concrete culverts were constructed in Flamboro village.

Commencing at the top of Dundas Mountain, an asphaltic concrete pavement was laid on a macadam base for a distance of 4.75 miles westerly. Dundas Mountain was also macadamized for a distance of 3,550 feet.

Between the eastern boundary of Beverley township and the village of Rockton, 2.5 miles of road was graded and standard ditches constructed. The macadam base was completed to Rockton village. Seven concrete culverts were built in Beverley township, and the road was oiled through the villages of Rockton and Sheffield. South of Galt a macadam base was laid a distance of 2.6 miles to connect up with that already laid in 1920. The road was widened from toll



HAMILTON-KITCHENER PROVINCIAL HIGHWAY
Asphaltic concrete pavement 20 feet wide south of Galt.

gate to Elgin Street, and a 20 foot macadam base constructed, and from the toll gate to Little's Corners one mile of standard ditch was constructed.

From Galt to Preston only maintenance was undertaken.

Between Preston and Kitchener, 3 miles of the road was graded and widened to 30 feet in preparation for the concrete pavement which is proposed to be built next year.

PORT CREDIT-OWEN SOUND HIGHWAY

Grading was completed between Port Credit and Cooksville, culverts were also built on this section and a macadam base was constructed. This section was built to connect the Toronto and Hamilton highway with Dundas Street.

From Cooksville to Brampton only light maintenance was undertaken, but nearly all culverts were completed to allow for continuation of grading and macadam base in 1922.

Grading was carried on for a distance of 2 miles north from Brampton. Gravel was also placed on this new surface and a light maintenance coat continued through to Orangeville, making this a first-class gravel road.

North of Orangeville, grading was completed to the hamlet of Camilla, a distance of $8\frac{1}{2}$ miles. Culverts were also completed on this section, which was later gravelled. From Camilla to Shelburne dragging was done, but no construction was undertaken. Commencing at Shelburne, a light coat of gravel was applied through to Flesherton, Markdale and Chatsworth, and later to Owen Sound.

ARTHUR-KINCARDINE HIGHWAY

From the intersection of this road with the Guelph-Owen Sound highway, the road was graded westerly for about $\frac{3}{4}$ of a mile and a macadam base constructed. The greater part of the highway between Arthur and Harriston was lightly gravelled and some light grading done where necessary. Westerly from Harriston for four miles the road was gravelled. Gravel was also applied

through the village of Clifford and westerly for two miles. One mile of heavy grading was done between Clifford and Mildmay and the road through Mildmay received a light coat of gravel. From Mildmay to Walkerton general maintenance was carried out and the road patched with gravel where required. The road was gravelled for a distance of 2 miles on either side of the Brant-Greenock township boundary, a short stretch of heavy grading was done a few miles west of Walkerton, and 2 steel bridges erected over the branches of the Teeswater River, one of 30 feet span and the other a semi-through truss of two spans, each 75 feet long. Eight culverts were constructed between Walkerton and Kincardine, preparatory to grading in 1923, and twelve miles of the highway east of Kincardine was lightly gravelled.



ONTARIO PROVINCIAL HIGHWAY

Applying Calcium Chloride on Gravel Surface as a dust preventative.

REPORT ON COUNTY AND TOWNSHIP ROADS

By DISTRICT ENGINEERS

TORONTO, June 21st, 1922.

W. A. McLEAN, Esq.,

Deputy Minister of Highways, Ontario.

SIR:

I have the honour to submit a report on work carried out on the County and Township roads in the Counties of York and Peel.

Yours respectfully,

ARTHUR SEDGWICK,

District Engineer of Municipal Roads.

YORK COUNTY

On the Sutton Road in East Gwillimbury, and between Sutton and Jackson's Point and westerly on the baseline in North Gwillimbury, 4 miles of waterbound macadam was built. This work also received a surface treatment of tar. The macadam varied from 16 to 18 feet in width and from $7\frac{1}{2}$ to 10 inches in depth. The total cost was \$66,500.16. Between Queensville and Belhaven, and from lot 7 to lot 20 in Georgina, 4 miles of heavy gravelling was distributed at a cost of \$16,000.00. The abutments for the Crousberry bridge over the Black River in Georgina township were completed at a cost of \$18,226.17. The depth to which the footings had to be carried made this a very difficult and expensive piece of work. The superstructure is being built in 1922.

In Newmarket, 3,578 feet of asphaltic concrete pavement was completed on a base which was commenced the year previous. On the Kennedy road $1\frac{1}{4}$ miles of bituminous macadam pavement 20 feet wide was built, south from the C. N. R. crossing in Con. C, Scarboro, at a cost of \$38,416.04. Two and one-half miles of waterbound macadam with tar surface were built north of Unionville, and another three-quarters of a mile was built on the Whitechurch-Markham townline. One and a quarter miles of gravelling was also done on this road in Markham and Whitechurch townships. On the Vaughan road, seven-eighths of a mile of 20-foot bituminous macadam pavement was constructed between Mulberry and Oakwood streets at a cost of \$23,495.88. Between lots 1 and 5 in King township, 6,600 feet of waterbound macadam with tar surface was built at a cost of \$33,465.15. In addition to the above, a foundation course was commenced in Vaughan township preparatory to building a bituminous macadam pavement in 1922. On the Weston road about one mile of asphaltic concrete pavement 20 feet wide was constructed at a cost of \$49,000 per mile, and in the village of Woodbridge 3,049 feet of 18-foot bituminous macadam was built at a cost of \$29,800 per mile. Adjoining the south end of this, 2,300 feet of waterbound macadam with tar surface was built. In King Township, a half-mile of gravelling was done. On the Don Mills road, 3,633 feet of 20-foot asphaltic concrete pavement was built through the Todmorden district at a cost of \$44,700 per mile, and a 90-foot span, 20-foot roadway, concrete bowstring arch bridge was constructed over the Don River at a cost of \$25,000. On the Langstaff road, 3 miles of waterbound macadam was built east of Markham. On Road No. 10, $2\frac{3}{4}$ miles of macadam and gravel road was built. On the Mt. Albert road 3 miles of grading and nearly 2 miles of gravelling was done, and on the Pine Orchard road 1 mile of gravelling was done. On the Lloydtown road four miles of heavy grading and gravelling was done between Aurora and Schomberg at a cost of \$17,500, and a further stretch of nearly one mile of gravelling was put on east of Aurora. On the Lansing road, $1\frac{1}{2}$ miles of waterbound macadam was built west from the Kennedy road. On Road No. 18, one-half mile of waterbound macadam was built north from Long Branch.

The above is a brief resume of the chief work carried out on the county roads during 1921. The total expenditure amounted to \$671,671.30, of which some \$60,000 was expended for general maintenance.

The experiences of the last two or three years compels one to conclude that in the southern area of the county the density of the traffic radiating from Toronto necessitates the very best and strongest type of construction, and the area embracing this heavy traffic is steadily expanding. The congestion will probably only be partially and temporarily relieved when the Provincial Highways reach their full efficiency. The county authorities are recognizing this condition by rebuilding the ordinary macadam roads with asphaltic concrete and bituminous macadam. On the northern lateral roads good gravel and waterbound macadam roads will be the most economical type to build for some years to come.

Township Work

With the exception of King, all the townships participated in Government aid for township work. In the north, where gravel is available, considerable improvement is made in the local roads with comparatively small expenditure. In the townships surrounding the city of Toronto there is an extensive urban area with comparatively low assessments. In this area large expenditures are necessary to keep the roads from becoming impassable during the spring and fall seasons.

PEEL COUNTY

With the exception of the Brampton sideroad, Peel County roads are subjected to traffic which is more purely local. Road improvement is, therefore, spread around in shorter stretches than would otherwise be required. Construction work consisted chiefly of stone and gravel surfacing and was distributed over the various townships as follows: Caledon, $1\frac{3}{4}$ miles; Toronto Gore, 2 3-8 miles, and Toronto township, $14\frac{1}{2}$ miles. Toronto township had a large unexpended balance from the preceding years, which accounts for the larger programme carried out in that township during 1921. The total expenditure amounted to \$131,727.28, including some \$30,000 for maintenance work.

Township Work

All the townships availed themselves of the usual Government aid for township road work. Toronto township did a large amount of grading work in addition to a moderate amount of gravel and stone surfacing.

W. A. McLEAN, ESQ.,
Deputy Minister of Highways, Ontario.

TORONTO, January 30th, 1922.

SIR:

I hereby beg to submit a summary report of the county and township road work as carried out in the counties of Elgin, Essex, Kent, Lambton and Middlesex and the townships therein under the Highway Improvement Act and the Ontario Highways Act.

It is gratifying to note on county work in this district that the spreading of gravel is receiving more attention. Experience has shown that a thin layer of new gravel spread two or three inches thick over the old surface and carefully dragged produces a surface that is smooth and permits a larger mileage to be resurfaced. Numerous gravel pits have been purchased by all the counties. All five counties are operating motor trucks for gravel distribution.



PELEE ISLAND TOWNSHIP ROAD
Gravel surface sixteen feet wide.



ESSEX COUNTY ROAD

Bituminous macadam surface 18 feet wide on the "Pike Road," east of Amherstburg.

It is gratifying to find the townships taking up the matter of township aid. In 1920, 16 townships out of a total of 57 participated, while in 1921, 50 townships participated, and the probability in 1922 is that 55 out of the 57 will be participating. The improvement of the sideroads and concession roads is a live issue in all municipal councils.

With regard to statute labour, 35 townships have abolished or commuted statute labour in this district and 22 still retain statute labour. Since the inauguration of Government aid to townships in the year 1920, 20 out of the above 35 townships abolished or commuted statute labour.

Numerous visits were paid throughout the season to the township, officials where matters of special importance were considered.

Labour conditions for 1922 look to be very promising, and in those counties of Kent and Essex considerable reduction in concrete pavement prices seem to be evident.

Respectfully submitted,

J. A. P. MARSHALL,

District Engineer of Municipal Roads.

ESSEX COUNTY

Essex County during 1921 spent over \$511,000.00 on the County Road System. To the end of 1921, since the county first entered the system, the expenditure has amounted to \$1,182,954.78, on which the county received a grant of over \$524,000.00.

During the year Essex County constructed about 6 miles of concrete roads at the following locations:

- (1) Leamington, No. 31, 4,900 lin. feet. (Day labour.)
- (2) Howard Ave., No. 4, 16,720 lin. feet. (Suburban Roads.)
- (3) Maidstone, No. 86, 5,700 lin. feet. Contract.
- (4) Belle River, No. 86, 2,900 lin. feet. Contract.
- (5) Pike Creek easterly No. 86, 3,700 lin. feet. Contract.

It was hoped that some improvement would have been done on the River Road between Amherstburg and Windsor, but the matter will probably be given first consideration in 1922. The work in Harrow consisted of a bituminous macadam pavement which was completed with the exception of the seal coat, which will be done early in 1922.

Considerable gravelling was done and it is giving splendid results. This gravel is shipped from the Hickey pit at Leamington to the various railway points within the county and then teamed to the particular locality. About 40 miles of new gravelling was done during 1921, while about 20 miles were resurfaced. In addition to the loading and shipping sufficient gravel for the county roads, the Department of Public Highways and various local municipalities were supplied with over 300 cars of gravel. With regard to bridges and culverts, 5 bridges

of 12 to 18-foot spans were constructed and 12 reinforced concrete culverts from 4 to 9-foot spans.

Work on the Windsor Suburban Roads consisted of the building of Howard Avenue concrete roadway as outlined above. Three concrete culverts were built on Road No. 1 in Sandwich West and 2 miles of grading and graveling on Road No. 6 from Walker Road easterly.

The following table shows the mileage of the various types of road at the end of 1921.

Type	Provincial Highway Miles	Provincial County Miles	County Miles	Township Miles	Total Miles
Earth.....	12.41	45.50	89.32	589.25	736.48
Gravel.....	44.42	5.00	107.25	287.50	444.17
Stone.....	....	5.50	4.50	8.00	18.00
Bit. Macadam.....	....	2.00	0.50	....	2.50
Concrete.....	2.75	6.50	8.38	6.00	23.63
Total.....	59.58	64.50	209.95	890.75	1,224.78

Percentage of roads surfaced—39.86%.

Township Work

The following townships in Essex County took up the matter of Township Aid: Anderdon, Colchester South, Gosfield South, Maidstone, Mersea, Rochester, Sandwich East, Tilbury North and Pelee Island. Of these, Colchester South, Gosfield South, Maidstone, Rochester and Sandwich East have township road superintendents; Mersea and Anderdon still retain statute labour. The approved expenditure made by the above townships on township work for 1921 amounted to approximately \$64,000.00. Special mention should be made of the organization and work as carried out in South Gosfield township. The following townships will probably take up the matter of township aid in 1922: Malden, Colchester North, Gosfield South, Tilbury West.

ELGIN COUNTY

A systematic maintenance of gravel roads has been carried out during 1921 in Elgin County. During the year approximately 150 miles of resurfacing was done. The chief work done during the year was the construction of Silver Creek bridge opposite lot 17, concession 1, Malahide. The new reinforced concrete bridge is 100 feet in length with a 16-foot clear waterway and 12 feet high. The fill and earthwork necessitates the moving of approximately 15,000 cubic yards of earth. The bridge was built by the county by day labour.

During the year a new 5-ton motor truck was purchased. This, along with the two trucks (5-ton) purchased in 1920, makes a fleet of 3 trucks operated by Elgin County.

The method of applying gravel and keeping the surface of the county roads in good condition is to be commended. There remains only 19 miles of county roads not surfaced out of a total of 262 miles. When it is taken into consideration that Elgin County took up the matter of county roads in 1917, it speaks well for the organization and the work that has been done by the county officials.

The following table shows the mileage of various types of road at the end of 1921:

Type	Provincial Highway Miles.	Provincial County Miles.	County Miles.	Township Miles.	Total Miles.
Earth.....	1.70	....	19.00	336.25	356.95
Gravel.....	56.60	35.25	192.57	507.75	792.17
Stone.....	....	3.50	12.00	4.75	20.25
Total.....	58.30	38.75	223.57	848.75	1,169.37

Percentage of roads surfaced—69.47%.

Township Work

All the townships in Elgin County are taking the Government aid. The work in North Dorchester, Yarmouth, Malahide, Dunwich and Bayham, is directed by township road superintendents. During 1921, the township of Yarmouth purchased a motor truck and loading bin at a cost of \$10,000. All the townships in Elgin County have either commuted or abolished statute labour. 1921 expenditure on township work (approved) amounted to \$128,797.19. Special mention should be made of the good work carried out by South Dorchester and Yarmouth townships during 1921.

KENT COUNTY

Kent County during 1921 spent on the County Road System \$567,930.48. Since 1917 the total expenditure made by the county has been \$889,552.25, so that the expenditure made in 1921 was by far the largest outlay for any one year. During the year, 12 miles of concrete roads were constructed. The contract prices ranged from \$2.60 to \$3.83 per square yard. On the Chatham Suburban Roads, Provincial County Road No. 62, 2.75 miles of concrete pavement was constructed, 18 feet in width. From the end of this at the Gregory drain to Cedar Springs, gravelling was done. Other stretches of concrete pavements were built in the vicinity of Paincourt, Tilbury, N. Thamesville and east from Wallaceburg. Greater care should be given to the matter of efficient concrete inspection. The proper completion of side-ditches and shoulders on these concrete roadways should receive prompt attention.

Special grants were made to the urban municipalities of Wallaceburg, Ridgetown, Blenheim, for the purpose of building connecting links of the County Road System.

During the year 15 acres of gravel was purchased by the county just west of Cedar Springs on Talbot Street and a storage bin and loading equipment was erected. Two motor trucks were purchased. With the trucks and teams about 25 miles of gravelling has been done and the work is standing up in first-class condition. The Duffis Creek Bridge just south of Thamesville was completed, as was also Otter Creek Bridge north of Wallaceburg.

The following table shows the mileage of various types of road at the end of 1921:

Type	Provincial Highway Miles.	Provincial County Miles.	County Miles.	Township Miles.	Total Miles.
Earth.....	25.56	29.98	107.87	909.50	1,072.91
Gravel.....	61.80	36.50	56.50	305.50	460.30
Stone.....	.....	1.00	.....	.....	1.00
Concrete.....	0.50	10.27	3.13	.....	13.90
Total.....	87.86	77.75	167.50	1,215.00	1,548.11

Township Work

All the townships (10) in Kent County participated in the 20 per cent. aid to townships for 1921. The township of Zone appointed a township road superintendent. The townships of Harwich, Orford, Raleigh and Romney still retain statute labour.

LAMBTON COUNTY

During 1921, Lambton County resurfaced about 80 miles of county roads with gravel. Three new motor trucks were purchased in 1921, and this, along with two trucks purchased in 1920, makes up a fleet of 5 trucks. Considerable hill cutting has been done at Wilkesport and between Alvinston and Waterford. A number of substantial bridges have been constructed during the year, chief of which were Telford bridge and Bradshaw bridge. The concrete work on bridges and culverts throughout has been of a good character and shows the benefit of efficient inspection and supervision. More attention has been given to the matter of spreading gravel and the results are beginning to show the benefits.

The following table shows the mileage of various types of road at the end of 1921:

Type.	Provincial Highway Miles.	Provincial County Miles.	County Miles.	Township Miles.	Total Miles.
Earth.....	.....	28.50	123.75	762.00	914.25
Gravel.....	37.98	56.00	123.25	518.00	735.23
Stone.....	.....	.....	5.25	.....	5.25
Concrete.....	2.50	.....	.....	.....	2.50
Total.....	40.48	84.50	252.25	1,280.00	1,657.23
Percentage of roads surfaced—44.83%.					

Township Work

All the townships in Lambton County, with the exception of Dawn Township, took advantage of Government aid during 1921. The townships of Brooke, Euphemia, Plympton and Warwick still retain statute labour. The total approved expenditure for 1921 on township road work was \$122,227.00.

MIDDLESEX COUNTY

The county's expenditure on county roads for 1921 amounted to \$218,599.01. Approximately 125 miles of resurfacing with gravel has been completed. The county graded approximately 12 miles and gravelled 12 miles of the system during the year. Considerable hill cutting has been done in the vicinity of Parkhill and in McGillivray Township.

A gasoline gravel loader was purchased during the year and has given good satisfaction. The county purchased one motor truck and turned in one of their used trucks (5-ton) and obtained a new 3½-ton truck. This makes a fleet of four motor trucks for the county. The operating of these motor trucks has cut the cost of graveling less than half of what it formerly was with teams.

After a few years' delay on the London Suburban Roads, plans are under way for the improvement of the roads during 1922.

A grant was made to the village of Glencoe for the purpose of building a concrete pavement on the main street of the village.

The following table shows the mileage of the various types of road at the end of 1921:

Type	Provincial Highway Miles.	Provincial County Miles.	County Miles.	Township Miles.	Total Miles.
Earth.....	6.64	.....	28.30	440.50	475.44
Gravel.....	87.07	58.25	352.20	1176.50	1,674.02
Stone.....	.....	.....	2.00	3.00	5.00
Concrete.....	5.50	.....	.....	.....	5.50
Total.....	99.21	58.25	382.50	1,620.00	2,159.96

Percentage of roads surfaced—77.98%.

Township Work

All the townships in Middlesex County took advantage of the Government aid in 1921. The townships of McGillivray, Lobo, and Delaware appointed township road superintendents. The townships of Mosa, West Nissouri, Biddulph, North Dorchester and London townships still retain statute labour. The appropriated expenditure on township roads in Middlesex county amounted to \$180,000. Special mention should be made of the system and organization as carried out in Lobo township.

TORONTO, May 15th, 1922.

W. A. MACLEAN, ESQ.,
Deputy Minister of Highways, Ontario.

SIR:

I have the honour to submit a summary report on the work carried out on county and township roads during the year 1921 in the counties of Carleton, Prescott and Russell, Renfrew, and Stormont, Dundas and Glengarry.

Most of the townships, with the exception of those in Renfrew which are receiving Colonization Aid, availed themselves of the aid as provided for in the 1920 legislation of the Ontario Highways Act, and the present outlook is that the few remaining townships will shortly fall in line. Statute labour has been either commuted or abolished in the majority of the townships and, with the possible exception of Renfrew County, Statute Labour should be a thing of the past in the very near future in this district.

It is gratifying to report that the programme carried out showed a tendency towards greater continuity in construction and a fuller realization that drainage is the first principle of construction.

Respectfully submitted,

C. W. CORNELL,
District Engineer of Municipal Roads.

CARLETON COUNTY

The county of Carleton, including the suburban roads, had 284 miles of roads in their County Road System at the end of 1921. Of this mileage some 51 miles were designated as Provincial County Road and the rest as County Road. Of this about 30 miles are suburban roads adjacent to the city of Ottawa.

A large programme of work was carried out during the past season which involved in all a total approved expenditure of \$807,855.25. Of this, approximately \$358,000 was spent on the suburban roads, while the remainder was distributed throughout the County Road System. The work on Provincial County Road No. 89, known as the Metcalfe Road, consisted of the



CARLETON COUNTY ROAD

Asphaltic concrete surface 20 feet wide on Metcalfe Road, Ottawa Suburban Roads Commission

construction of 4 miles of waterbound macadam roadway from the Dundas County boundary northerly through the village of Vernon. In addition to this, 3 miles of grading was completed along with the necessary tile and small concrete culverts. On several county roads throughout the county some 16 miles of grading was completed in addition to the construction of 10 miles of stone road and 15.83 miles of gravel road. The outstanding work completed by the Ottawa Suburban Roads Commission was 9.2 miles of waterbound macadam roadway, which was constructed on the Metcalfe Road from near Billings' Bridge to the Osgoode boundary. Part of this road had a bituminous surface treatment and the outlook is that in the very near future the greater part, if not all, of this road will have a surface of asphaltic concrete. In addition to the above, the Suburban Roads Commission completed one mile of waterbound macadam on the Richmond Road and 1.38 miles on the Bowesville Road and also 4.75 miles of grading on the Russell Road. Three bridges were constructed by the Commission during the season, varying in span from 12 to 18 feet. The most important of these was the Sawmill Creek bridge, a reinforced concrete structure carrying a heavy fill, built on the Metcalfe Road near Billings' Bridge at a total cost of \$13,393.00.

Quite a large bridge programme was carried out in the county, nine structures being completed, varying in span from 10 to 59 feet. The most important of these were the Carlsbad Springs bridge and the Stevens' Creek bridge. The former is a 50-foot span and the other a 59-foot span. Both are of steel superstructure on concrete abutments. In addition, the Kenmore bridge was constructed on County Road No. 7. This is a two-span structure on concrete abutments and pier, one span being 50 feet and the other 72 feet.

Township Work

All the townships in the county took advantage of the aid available under the Ontario Highways Act, and all but two townships appointed road superintendents. Four out of the ten townships in the county have abolished statute labour, five townships have commuted it and one still retains statute labour.

UNITED COUNTIES OF PRESCOTT AND RUSSELL

The United Counties of Prescott and Russell adopted a County Road System in 1916. The system at that time consisted of 225 miles of the leading roads throughout the United Counties. As it now stands it consists of eight miles of Provincial County Road, and 223 miles of County Roads. It was evident at the outset that a very large programme of maintenance and construction would eventually have to be undertaken to get even the leading roads of the County System in passable shape for the ever increasing motor traffic. The county officials apparently realized the situation as is evidenced by the steady increase in their county road appropriations. The approved expenditure in 1921 amounted to \$656,026.06.

The outstanding single piece of work during the season was the construction of 5½ miles of bituminous penetration road 16 feet wide on Provincial County Road No. 130, between

Hawkesbury and Vankleek Hill. In addition, a large programme of work was carried out on several county roads throughout the system, consisting in all of some 5.95 miles of grading, 20.16 miles of stone road, 6.62 miles of gravel road and 5.25 miles of bituminous penetration surface. A large bridge programme was also carried out during the season, eleven structures in all being completed. These varied in span from 12 to 40 feet and consisted for the most part of steel superstructure on concrete abutments.

Township Work

Nine out of the eleven townships in the United Counties took advantage of the aid available under the Ontario Highways Act, Longueil and Caledonia being the two exceptions. All of the townships which passed the necessary expenditure by-laws appointed road superintendents. Seven of the eleven townships have commuted statute labour, one has abolished it, and three still retain statute labour.

RENFREW COUNTY

The easterly portion of Renfrew County, consisting of ten townships, adopted a County Road System in 1917. Comparatively little, except organization and preliminary work, was done until the year 1919. Since then, however, the amount of money appropriated for county roads has gradually increased, amounting this year to a total approved expenditure of \$450,607.62.

The County Road System at the close of 1921 consisted of 47.5 miles of Provincial County Roads and 172.5 miles of County Roads, a total of 220 miles, which is approximately 23 per cent. of the total road mileage in the area covered by the County Road System.

The physical features of Renfrew County are such that many costly construction problems are presenting themselves, especially on Provincial County Roads, which some of their more fortunately situated neighbours do not have to contend with. The rocky and winding nature of many of the leading roads necessitates a large amount of rock work to give the necessary clear line of vision and also to bring them to the Departmental standard. The result is that the cost per mile for construction, no matter what type of road is constructed, in a great many cases will run much higher than in more favourably situated counties.

The work on Provincial County Roads this season consisted of the construction of 7.3 miles of crushed stone road, in addition to grading 6.85 miles and building the necessary culverts preparatory to construction next year. The town of Renfrew received a grant on their Provincial County Road connecting link.

The County road work consisted of grading 2.25 miles and the construction of 6.2 miles of crushed stone road and 31.3 miles of gravel road. In addition, one 20-foot span reinforced concrete bridge was built on Provincial County Road No. 96, while the County Road bridge work consisted of some four structures varying in span from 10 to 36 feet. The 36-foot span was composed of a concrete substructure with a steel superstructure.

Township Work

The townships in the area covered by the County Road System are receiving Colonization Road aid so that they were not eligible for the grant under the Ontario Highways Act.

UNITED COUNTIES OF STORMONT, DUNDAS AND GLENGARRY.

The United Counties of Stormont, Dundas and Glengarry adopted a County Road System in 1916. The system at that time comprised some 433 miles of the main thoroughfares throughout the United Counties. The system as it now stands consists of 122 miles of Provincial County Roads and 292.5 miles of county roads.

The roads at the time the system was designated were for the most part in poor condition and suffered largely from want of maintenance. This necessitated a somewhat large and progressive programme as the problem was to keep passable the maximum amount of ordinary roads while construction or extensive improvement was taking place on the more important roads. How well this programme has succeeded is shown by the fact that of the 122 miles of Provincial County Roads, 28.5 miles are built of gravel, 51.5 miles are of stone and 25 miles of bituminous surface; and of the 292.5 miles of County Roads, 94.5 miles are of gravel, 92.5 miles are of stone and 20.5 miles of bituminous surface, so that it is apparent that the greater portion of the County System has received at least a coat of metal. The unmetalled portion has received considerable draining and grading in preparation for future construction.

The United Counties undertook a very large programme of work during the past season. In all, some 30 miles of waterbound macadam roadway were constructed on Provincial County Roads. This included the grading, metalling to the full 16 feet in width and the laying of pipe and tile culverts and the building of small concrete culverts. A considerable proportion of the stone roads will eventually receive a bituminous surface treatment. The average cost of the work was approximately \$12,125 per mile. A similar extensive programme was carried out on County Roads, approximately 27 miles of waterbound macadam roadway being constructed up to the County Road standard at an approximate cost of \$11,725 per mile. One of the first

difficulties met with in these counties when construction is attempted is the narrow right-of-way which is characteristic of several of the eastern counties. The counties, however, are adhering to the policy of widening the right-of-way before starting construction. The bridge construction programme was not an extensive one and consisted mainly of four small concrete structures of 16-foot span with the usual width of roadway.

In addition to the above, a large programme of maintenance and repair was in evidence throughout the counties, some \$107,898.57 having been spent in this manner. Continuous stretches of loose stone or gravel were applied in many cases, which will serve as a base for future work and in the meantime will keep the traffic out of the mud and give the people a reasonably passable road until such time as construction can be undertaken.

If the present rate of construction can be maintained in these counties together with a suitable appropriation for maintenance, bad roads on the County Road System should in the near future be a thing of the past.

Township Work

All the townships in the United Counties with the exception of Lochiel took advantage of the aid available under the Ontario Highways Act, and with the exception of Osnabruck and Matilda, road superintendents were appointed by each township. Eight out of the twelve townships have abolished statute labour, one has commuted, one partially commuted, and two still retain statute labour. The outlook, however, is that in the very near future statute labour will be entirely abolished in the United Counties.

TORONTO, April 13th, 1922.

W. A. McLEAN, ESQ.,
Deputy Minister of Highways, Ontario.

SIR:

I have the honour to submit a summary report on the work carried out under the Highway Improvement Act during the year 1921 in the counties of Ontario, Victoria, Durham and Northumberland, Peterboro and Prince Edward, in pursuance of the provisions of the said Act.

With the exception of Ontario County substantial additions were made to the number of townships taking aid under the Act in all the counties. There still remain a few townships however, which for one reason or another have not come under the Act. It is to be hoped that these will soon avail themselves of the provisions of the Act. As councillors and reeves of the township the county councillors get their primary education in road building. In those counties where the townships are taking aid a noticeable improvement may be seen over those which are not. It is shown in the character of the work undertaken and the manner of carrying it out.

Considerable work of a permanent nature in the building of bridges and culverts, putting down of macadam road and hill cutting was undertaken during the year throughout the counties. The usual maintenance was carried out on the roads as well.

The construction of roads is in a large measure a question of labour. In this connection a noticeable advance has been made in the organization and direction of the labour element. Efficiency was the keynote of the summer's work. It is well this is so. Owing to the lowering in the cost of wages there is grave danger of efficiency being lost sight of, with the inevitable result of a higher cost per mile of road. In addition, labour is becoming more plentiful, so that officials are not so chary in demanding efficiency from labour.

The system of financing followed in these counties is the same. That is, they levy a tax of so many mills for County Road purposes. The expenditure upon the roads can then be said to come from the county's income. They are not touching their borrowing power or their capital account. It is a system that is absolutely safe and sound as it leaves their capital unimpaired.

Respectfully submitted.

JOHN MACVICAR,
District Engineer of Municipal Roads.

ONTARIO COUNTY

The total road mileage for this county is 1,550 miles. Seventy per cent., or about 1,085 miles, of this is surfaced with gravel, stone or bituminous penetration. This is a creditable showing for the county. Of this mileage 153 miles are County Roads, 58 miles are Provincial County Roads, and 42 miles are Provincial Highways.

At the inception of the County Road system in this county a wise policy was adopted by the officials. They have consistently kept in mind the permanent features of the road problem. A large proportion of their expenditure was made upon the following features, viz.: alignment, drainage, structures, foundations, and grades. That is, their expenditures have been made in the nature of investments and upon which they will reap a large interest in the way of lessened cost of maintenance on these roads as time goes on. I am sure it cannot but be gratifying to

the Department to know that for practically all monies paid out to this county, work of a permanent nature can be seen for it. A total of \$89,965.00 has been expended by the county on concrete culverts and bridges to date. The total amount paid by the Department in grants is only slightly in excess of that amount.

It is now four years since the County System was adopted in this county and during that time they have constructed 42 reinforced concrete culverts out of a total of about 120, and 20 bridges of reinforced concrete or steel out of a total of about 35 on the system. In 1921, the county constructed 21 reinforced concrete culverts and 6 concrete bridges at a cost of approximately \$33,500.00. The work for the most part was carried out under contract. On the construction of the Provincial County Roads, \$8,454 has been expended, and on maintaining them \$20,411 has been expended. Upon County Roads there has been expended \$21,179 on construction and \$49,758 on maintenance. These sums include expenditure upon permanent features such as alignment, ditching and foundations and grade reductions. The perishable features of the highways also came in for considerable attention. Long stretches of the roads were gravelled.

Township Work

The township roads comprise a total of 1,290 miles. Of this mileage about 460 is earth road, 790 gravel and 42 broken stone. Of the township roads there is 64 per cent. surfaced. A number of concrete culverts of approved design were built by the different townships. In addition, considerable resurfacing was done with gravel.

VICTORIA COUNTY

The southern six townships of Victoria County have a grand total of 948 miles of road. Out of this, there are about 13 miles of Provincial Highways, 190 miles of County Roads and 745 miles of Township Roads. On the County Roads 184 miles are gravelled and 6 miles are earth. On the township roads about 205 miles are earth and 540 miles are gravelled.

During the past season the work for the most part was of an excellent nature. This results from a workable organization together with a good selection of road building machinery. The day labour system is in vogue and the wage item alone amounts to about 60 per cent. of the total expenditure, and this was left entirely in the county.

The type of road built was a macadam, rolled to a consolidated depth of about 8 to 10 inches. Field stone were crushed in the county's crushers and laid on the road, then rolled and finally treated with an application of oil. Of this type of road about $3\frac{1}{2}$ miles were built. The average cost was \$1.19 per square yard. Bolton Street, Bobcaygeon, was paved with a bituminous bound macadam. It is the business street of the village and it was thought advisable to pave the full width, supported by a curb and gutter.

Grade reductions were carried out in two rock cuts at Fenelon and Kelley's Hill; also earth hill reductions at Logan's Hill and Crawford's, Omeme. In addition a valuable improvement has been made to the system at Riaboro. At this point two level railroad crossings have been eliminated on the road leading from Lindsay to Peterboro. During the season 2 bridges, 15 box culverts, 59 pipe culverts and about 2,000 feet of tile drains were constructed.

Township Work

The township roads comprise a total of 745 miles. Of this, mileage about 205 are earth roads, about 497 are gravel and about 43 stone. Nearly 70 per cent. of the township roads are surfaced with either gravel or broken stone. This being the first year the townships in this county took advantage of Government aid, a great deal of the work was below standard. A number of culverts and some bridges were built, however, that were of approved design. Considerable resurfacing was done with gravel.

DURHAM AND NORTHUMBERLAND

In these United Counties there is a grand total of 2,658 miles of road. The Provincial Highway takes out 78 miles and of the balance 365 are county roads and 2,215 township roads. The county roads have 345 miles gravelled and 20 miles of earth. During the past season about 5 miles of gravel road were constructed. Of this amount, 3 miles were on Provincial County Roads and 2 miles on county roads, at a total cost of \$42,000.00. In addition to this expenditure, nearly \$50,000 was expended upon maintenance and repair of the roads. Four large bridges were constructed during the year at a cost of \$11,500. The special grants to towns and villages amounted to \$14,000, which was expended upon construction in the various places. Considerable improvement is to be noted in these counties in the organization for handling the work. Larger units were employed with the result that the work came more closely under the direct supervision of the superintendent. As a consequence a very great improvement in the class of work done is noticeable. The counties require a better equipment of modern road building machinery and as this is provided further improvement in the road building organization will result.

Township Work

Practically all the townships in the United Counties of Durham and Northumberland are taking aid under the Ontario Highways Act. Some are working under a superintendent, but most of them are working under the reeve, as they have not yet abolished statute labour. Of the total 2,215 miles of township roads only 967 are gravelled. Thus 1,243 miles are still earth roads. In a county where road building material is plentiful this is a backward condition to find. However, a noticeable improvement is found in the interest taken in road building in the past few years. During the past summer a number of large bridges were built of approved design, also a number of concrete culverts. For the most part, however, the work consisted of resurfacing with gravel and some grading.

PETERBORO COUNTY

During the past season considerable construction work was done on the suburban roads. The type of road built is gravel, and $2\frac{1}{2}$ miles were built. Abundance of good gravel is available within easy hauling distance, though much of it was crushed owing to the prevalence of an over-size of stone. Grading outfits prepared the subgrade. Upon the county roads, resurfacing and patching was the main work undertaken.

At the inception of the County Road System in the county it is doubtful if the farmers seriously considered their income in relation to the mileage taken on. The grand total of mileage in the southern half of the county is 808 miles. Of this, 8 miles are Provincial Highways, 252 miles Provincial County and County Roads, and 548 miles are township roads. The funds provided to look after this 252 miles is about \$20,000. With so small a provision of funds, the mileage should be small in proportion, so that the amount would adequately care for the mileage.

Township Work

In Peterboro County there are six townships taking aid under the Act. Of these, Otonabee, Smith and Monaghan carried out quite extensive programmes consisting of grading, gravelling and some culverts of approved design. The township roads in this county comprise a total of 548 miles; of this, 184 miles are earth, 348 miles gravel and 15 miles stone.

PRINCE EDWARD COUNTY

There is a grand total of 603 miles of road in the county of Prince Edward. Of this mileage there is 29 miles of Provincial Highways, 126 miles of Provincial County and County Roads, and 447 miles of Township Roads. The County Roads have 25 miles gravelled, and 96 miles stoned. The townships have 3 miles stoned, 287 miles gravelled and 157 miles of earth.

During the past season the work for the most part was good. The type of road built was a water bound macadam. A block of about 500 feet in length was laid in the town of Picton of bituminous penetration. Quarries are opened at advantageous points along the roads and crushing outfits installed. The material is hauled an economic limit of about $1\frac{1}{2}$ miles each way from the crusher and rolled in the road. Grading outfits prepare the subgrade for the stone. In this manner over 5 miles of road were built in the county of Prince Edward during the past summer. In addition a few miles were resurfaced or patched. Upon road construction about \$20,000 were expended; upon maintenance and repair about \$36,000; on new machinery \$3,800. The chief items of machinery purchased were a steam engine and a tractor.

Township Work.

There are only two townships taking aid in this county. In one the work consisted almost entirely of grading and gravelling, resurfacing being the largest item. In the other, a new bridge of approved design was built. They also did resurfacing but no road construction work was undertaken.

W. A. McLEAN, ESQ.,
Deputy Minister of Highways, Ontario.

TORONTO, June 21st, 1922.

SIR:

I have the honour to submit the following report on county and township road work during 1921 in District No. 2, comprising the counties of Bruce, Huron, Oxford, Perth and Waterloo.

In the counties whose management of assumed roads is of a purely county nature, very satisfactory improvements were accomplished. A creditable mileage of road was brought up to Departmental standard, with particular attention to drainage and foundations; gravel resources were being studied and mobilized; road surfaces received increasing and effective patrolling, and the actual costs in each instance reflected the superiority of efficient organization.

Several counties, however, conduct their county road affairs on a township basis, as regards either management or financing, or both. They are, accordingly, of their own volition, labouring

under a serious disadvantage. The condition of the roads evidences a lack of systematic maintenance; results are not always commensurate with the costs; expenditures are not regulated, in every case, to fulfil the requirements of traffic. In numerous instances costly pieces of work have fallen below Departmental standards owing to lack of adequate county supervision and insufficient instruction to employees.

If, in fairness to those counties whose organization strictly conforms with the requirements of the Department, the same standard of workmanship were required of the counties who manage their county roads on township basis, the latter would benefit comparatively little from the financial assistance open to them under the Highway Improvement Act. Every effort is being made to revise and improve the systems referred to, the chief obstacle to reorganization being a hesitancy to depart from old customs.

All of the townships in the district, except the four in Bruce Peninsula receiving Colonization Aid, participated in the Provincial subsidy authorized by the Ontario Highways Act. Very encouraging improvement is evident, particularly in the townships that have abolished statute labour and have appointed road superintendents. From a survey of costs, involving over 300 records of work in the 55 townships concerned, the average cost of applying gravel by contract or day labour was 44½ cents per yard-mile (including loading and spreading) as against an actual equivalent of \$1.09 per yard-mile by statute labour, or of \$1.20 per yard-mile, adjusting all statute labour rates to common basis of \$2.00 per day. There were approximately 130,000 days of statute labour performed in District No. 2 in 1921, representing a commuted value of over \$240,000. Statute labour work being almost entirely confined to gravelling, if computed at a cost of 44½ cents instead of \$1.09 per yard-mile, an equivalent mileage of road could have been resurfaced for \$96,000, an average expenditure of \$2,400 per township concerned. This expenditure amounts to approximately one mill on the average township assessment.

Municipal officials recognize that the old system is inadequate and wasteful, but the average ratepayer, not realizing it to the same extent, through lack of knowledge of what savings are being effected by townships that have abolished it, advocates its retention. Progress is being made, however, and in numerous townships a campaign towards the abolition of statute labour is under way.

All of which is respectfully submitted,

H. IRWIN,

District Engineer of Municipal Roads.

BRUCE COUNTY

Bruce County Road system comprises 343.5 miles, being 17.3 per cent. of the total road mileage. With the exception of 9.5 miles of waterbound macadam, all the roads in the system are of gravel.

Provincial County Roads total 132.3 miles on which maintenance costs in 1921 averaged \$182.00 per mile. Construction work was continued on the "Centre Road" through the peninsula. The year's programme of blasting and rock work in Albemarle was satisfactorily completed. The hauling of field stone, to provide a roadbed through the Eastnor swamp (approximately 2 miles in length) was about 95 per cent. completed, lack of snow depriving the workmen of sufficient winter roads to finish the section. The greater part of this stone was spread and prepared for gravelling. Ditches and culverts in the swamp section were completed. In Brant Township, 3¾ miles of waterbound macadam cost \$8,400 per mile, complete.

County Road construction included 2¼ miles of crushed gravel on Road 21, westerly from Walkerton, at \$10,100 per mile including hill-cutting and numerous culverts.

Bridge work cost \$24,600 and \$33,750 on Provincial County and County Roads respectively. The former included two 55-foot reinforced concrete trusses in Huron Township and a complete new substructure and floor for Rae's Bridge north of Paisley. Eleven bridges were built on County Roads, the largest span being 122 feet, over the Sauble River, near Hepworth.

A total of \$8,000 was spent on new machinery, including one steam tractor, fourteen light graders, eight dump wagons, two concrete mixers and twelve drags.

Labour costs decreased during the year from 35 cents to 25 cents per hour for men and from 65 cents to 50 cents for teams. Stone and gravel crushing averaged 60 cents per cubic yard elevated to bins, the figure being above normal owing to the crushing of considerable quantities of field stone in localities devoid of gravel. Concrete work averaged \$10.00 per cubic yard, steel supplied.

The chief connecting link construction took place in the towns of Walkerton and Wiarton. The former laid a 2½-inch bitulithic pavement on a 6-inch concrete base, costing \$57,000 for paving at \$3.60 per square yard. Wiarton added approximately one-half mile of one-course concrete pavement to the portion completed in 1920, at a cost of \$2.48 per square yard.

At the close of the year Mr. D. J. Izzard resigned from the office of County Road Superintendent after 40 years' service in county and municipal affairs. The offices of County Engineer and Road Superintendent were combined and G. E. Stephenson, B.A.Sc., was appointed, with J. H. Ruttle as Assistant Road Superintendent.

In 1921 the cost of engineering and supervision amounted to 3.1 per cent. of the expenditure, compared with an average of 3.7 per cent. for the two previous years.

Township Work

Of the sixteen townships, the four peninsular municipalities received Colonization Aid; the remaining twelve participated in the 20 per cent. grant. The total approved expenditure amounted to over \$125,000 for a township road mileage of 1,607.47 miles, of which 1,063 miles are surfaced. The average expenditure per township was over \$10,000 or \$118 per mile of surfaced roads.

A number of townships effected gratifying improvements in bridge and culvert construction, the most notable structures being a 173-foot steel and concrete bridge at Maple Hill, in Brant Township and a 105-foot steel girder bridge in Culross. Huron Township built five bridges with spans varying from 20 to 50-foot.

Of the twelve townships concerned, statute labour has been abolished in two, commuted in two and retained in eight. The average cost of loading, transporting and spreading gravel by statute labour (adjusted to \$2.00 per day basis) was \$1.15 per yard-mile in the townships involved. Under contract or day labour procedure this operation throughout the county averaged 46½ cents per yard-mile. Two townships had duly appointed road superintendents in charge of their work during the year.

HURON COUNTY

The system in Huron comprises 98 miles of Provincial County and 329 miles of County Road, the total, 427 miles, being 19.9 per cent. of the total road mileage within the county. In view of the extensive and rapidly increasing summer traffic along Lake Huron, the entire Lake Road from Grand Bend to Amberly (with the exception of that portion within the town of Goderich) was designated a Provincial County Road during the year.

Expenditure on Provincial County Road construction was small, amounting to \$3,650, and involving an 8-foot reinforced concrete culvert in Morris, and 1¼ miles of crushed gravel construction in Stanley, both on Road No. 30. Maintenance on this class of road averaged \$405 per mile, of which \$302 was expended on resurfacing with crushed gravel. The completion of the Grand Bend Bridge and an 11-foot reinforced concrete bridge in Stanley, both on Road No. 117, totalled \$5,200 for bridge construction on Provincial County Roads.

On County Roads 10½ miles of crushed gravel construction averaged \$1,532 per mile including grading and drainage. A total expenditure on maintenance of \$81,500 averaged \$235 per mile including \$181 for resurfacing. Grading and dragging of roads cost \$29.50 per mile. Maintenance resurfacing comprised over 180 miles of a thin coat of material (mostly crushed) spread to the full width of the travelled road. Considering this, in conjunction with the low maintenance



HURON COUNTY ROAD
Grade reduction in Grey Township.

costs cited above, the effectiveness of timely maintenance, and the efficiency of a well-organized patrol system are revealed in the statements of road expenditure as clearly as they are evident to the users of the roads.

New machinery included eight light graders, six drags, eleven scrapers and fifteen gravel screens, a total expenditure of \$2,250. Repairs were light at \$1,788 considering the almost constant operations throughout the season of six crushing outfits.

Labour costs decreased during the season, the average being 25 cents per hour for man, 35 cents for foreman and 55 cents for man and team. Crushing cost 42 cents per cubic yard, concrete \$11.00 per cubic yard including steel. The cost of engineering and supervision amounted to 2.8 per cent. of the total expenditure.

The town of Wingham paved with one-course concrete one-half mile of connecting link on Provincial County Road No. 30 at a cost of \$2.83 per square yard including $1\frac{1}{4}$ miles of under-drain and considerable cut and fill.

Township Work

All townships, sixteen in number, took advantage of the Provincial subsidy provided by the Ontario Highways Act. On a total township road mileage of 1,670 miles the amount expended under the Act was \$126,000. There are 1,313 miles of surfaced township roads.

Statute labour has been abolished in four townships and commuted in two. Eight townships had road superintendents. The application of gravel cost \$1.30 per yard-mile by statute labour (\$2.00 per day basis) and 42 cents per yard-mile by contract or day work on the average basis of 30 cents per hour for men and 60 cents for man with team.

OXFORD COUNTY

At the close of 1921, Oxford County Road System comprised 29.2 miles of Provincial County, and 251.3 miles of County Roads, amounting to 20.9 per cent. of the entire road mileage.

Provincial County Road improvement was almost entirely confined to maintenance, costing \$23,974.61, or over \$820 per mile. Of this, only \$15.82 per mile was expended on grading and dragging.

County Road construction cost \$74,245.48. This included nearly 13 miles of underdrains, varying from 4 inches to 18 inches in diameter. On Road No. 39 in North Norwich, $1\frac{3}{4}$ miles of bituminous penetration pavement was constructed on a 8-inch stone base, at a cost of \$27,-442.79, or \$1.73 per square yard. About 16 miles of gravel road construction cost \$36,118.41 or \$2,257 per mile. Bridge construction consisted of a 44-foot steel and concrete structure on Road No. 31 in Dereham, costing \$3,648.55, and a similar 44-foot span on Road No. 35 in South Norwich, which cost \$3,857.25.

Maintenance costs on County Roads totalled \$86,558.62, an average of \$265 per mile, of which only \$10.80 per mile was spent on grading and dragging. The lack of any form of patrol system is clearly indicated on the small use of the drag and grader. That this is quite the reverse of representing a saving to the county is shown in the relatively high costs of maintenance per mile.

New machinery included one large and twenty-five small graders and six scrapers, the expenditure being \$5,830.71. Repairs and rentals totalled \$8,264.79, involving chiefly the complete overhaul of four crushing plants and the rental of a number of tractors.

The towns of Tillsonburg and Norwich constructed bituminous surfaced roads on connecting links. The former accomplished the surfacing of $1\frac{1}{4}$ miles for \$13,100.00 including culverts and underdrains.

Labour costs averaged 30 cents for men and 60 cents for teams per hour. Gravel haulage was reduced in cost to 40 cents per yard-mile (including loading and spreading) by the use of a motor truck. Concrete construction cost \$8.00 per cubic yard, reinforcing supplied. Tractors were rented for \$8.00 per day in many instances.

Engineering and supervision cost the county 1.2 per cent. of the total expenditure as compared with 1.9 per cent. in 1920 and 2.0 per cent. in 1919.

County Road management in Oxford is at a serious disadvantage, arising from the township organization that prevails. While machinery and general expenses are met by county funds, the expenditure on road and bridge construction and maintenance is a township, town or village matter. There is no road and bridge committee; the road superintendent and reeve of the municipality decide upon the extent and nature of the work that is to be done. There is no patrol system, consequently, although the expenditure on maintenance is high, the road surfaces are not given the attention warranted by the investment made therein. A heavy expenditure on reconstruction recurs every few years on nearly every road as a result of lack of maintenance supervision. These factors, together with an unequal distribution of gravel resources, indicate the economies that could be effected if a purely county system were adopted. This procedure cannot be too strongly emphasized.

Township Work

Of the eleven townships, five have abolished statute labour. Gravel, loaded, hauled and spread cost 41 cents per yard-mile when handled by contract or day labour, but averages \$1.07

in the townships retaining statute labour. Of the 1,039.5 miles of township roads, 839.4 miles are gravelled and 6.1 miles surfaced with broken stone. All townships received benefit from the 20 per cent. subsidy and expended slightly over \$133,000.

PERTH COUNTY

There are 33.6 miles of Provincial County Roads and 203.2 miles of County Roads in Perth. This mileage involves 17.5 per cent. of all the roads, and includes 0.5 miles of concrete, 3.2 miles of bituminous surface, 9.8 miles of stone, 217.2 miles of gravel and 6.1 miles of earth roads.

On Road No. 46 (Provincial County) a concrete pavement one-half mile in length was constructed through the village of Atwood in the township of Elma, the expenditure being \$16,531.15. The work was not done in accordance with the specifications stipulated by the Department, and portions of it failed before the close of the year. With the exception of 400 yards of crushed gravel construction in Moncton, the only other construction expenditure on Provincial County Roads was for underdrainage.

The chief item of maintenance expenditure covered the resurfacing of several portions of Provincial County Road No. 46 with crushed gravel at a cost of \$5,428.25. This work was not done in conformity with Provincial County Road standards and the subsidy allowed thereon was 40 per cent. of the cost. Out of a total maintenance expenditure on County Roads of \$55,000.00, resurfacing cost \$45,151.52, or an average of \$222.20 per mile, and grading \$23.44 per mile. County Road construction included 110 rods of waterbound macadam on a newly added portion of road from the G.T.R. station at Sebringville to the village at a cost of \$800, the Department supplying the stone to compensate for the extra wear on the old road occasioned during the construction of a neighbouring portion of Provincial Highway. There was also one-half mile of crushed gravelling in the village of Dublin, and some 392 rods of underdrains in various localities. Bridge work involved three structures, the chief being a 60-foot span, steel and concrete, in Mornington (County Road No. 14) costing \$5,655.50.

Too much emphasis cannot be placed upon the inadequacy of the County Road organization in Perth. Each township employs a foreman, or commissioner, who, under the direction of the reeve or township council, oversees the County Road work. Bills and accounts are sent to the County Road Superintendent, who charges them up to the roads concerned and passes them to the County Treasurer for payment. The County Road Superintendent is at the service of the townships for the preparation of bridge plans, estimates for drains, grades, etc., and acts generally in an advisory capacity as County Engineer. Apart from this, however, his duties are purely clerical, and the actual work of construction or maintenance has little or none of his personal superintendence. The most important duties pertaining to the office of County Road Superintendent are carried out by the Reeves themselves.

Perth, as a county, owns no machinery. Each township, operating completely within itself as regards County Roads, buys machinery, and uses it irrespectively of the equipment or needs of adjoining townships, and generally on County and Township Roads alike. It is obvious that County Roads in one township suffer the lack of certain equipment that is often lying idle in a near-by township.

The condition of County Roads in Perth indicates the lack of a suitable system of management. The county suffers from an unequal distribution of road material, from an inadequate arrangement as regards road machinery and from the lack of a system of maintenance and patrols. During 1921, the total expenditure on dragging, an operation strongly urged by the Department in the interests of smooth surfaces, amounted to \$3.80 according to the annual returns. The adoption of a purely county system of road management and finance would obviate most of these difficulties.

Township Work

Of 1,075 miles of township roads in Perth County, 829 miles have been gravelled and 33 miles surfaced with broken stone. The townships of Blanshard, Downie, Fullarton and Logan abolished statute labour some years ago and North Easthope commuted it this year. The application of gravel by statute labour methods averaged \$1.01 per yard-mile in 1921 as against an average of 48 cents per yard-mile for contract or day labour work. All townships received the 20 per cent. aid, the total approved expenditure on township roads being \$138,509.70, an average expenditure per mile of surfaced roads of approximately \$160.00. The township of Elma constructed six bridges during the year, 82-feet being the longest span, the bridge expenditure being \$13,882.00.

WATERLOO COUNTY

In Waterloo, with a total of 822 miles of all roads, 23.8 per cent. or 195.4 miles have been assumed as County Roads. There are 25.3 miles of Provincial County Roads, an additional 6.6 miles between Baden and Wellesley having been designated in 1921.

During the year the mileage of concrete roads in the system was increased to eight miles. There are 2.7 miles of stone, the remaining 184.7 being gravel roads.

On Provincial County Road No. 75, a total of 32,550 square yards of 7-inch concrete pavement 16-feet wide was laid by contract at \$2.24 per square yard. This important thoroughfare between the towns of Waterloo and Elmira was further improved at St. Jacob's Hill, by straight-

ening and grade reduction. In addition, about 750 linear feet of concrete, 16 feet wide, was laid on County Road 29b through Floradale.

Arthur Street, Elmira, a connecting link on Road No. 75, was paved with asphaltic concrete at a cost of approximately \$62,000 including grading.

The Kitchener Suburban Roads Commission laid 1.40 miles of concrete pavement in the vicinity of Bridgeport on County Road No. 10, at a cost of approximately \$44,500. This pavement is 20 feet wide, and was laid by contract at a cost of \$2.42 per square yard.

One new bridge, a 54-foot steel span with concrete abutments and floor, on County Road No. 25, and costing \$7,600, was the only expenditure under this heading, except the completion of guard rails on several structures built in 1920.

About nine miles of gravel roads were constructed to standard section, the chief items being 6.5 miles on Road No. 7, south from Breslau and 2.5 miles on Road No. 19, the average cost per mile being \$2,300. In all about \$165,000 was expended upon construction.

Maintenance expenditure averaged \$249.00 per mile. Labour costs averaged generally 30 cents per hour for man and 60 cents for teams. Slightly higher prices were paid, however, in the vicinity of Galt and Kitchener, where city prices had to be met. The general condition of gravel roads in Waterloo indicates the lack of a suitable system of patrolling the roads. Material is plentiful and of good quality, especially if crushed. The county council is considering the adoption of a straight county system of road management to facilitate the development of an adequate system of patrols.

Township Work

Approved expenditure on Township Roads in 1921 totalled \$46,776.13. All townships received aid through the Ontario Highways Act. Graveling, per yard-mile averaged \$1.22 under Statute Labour and 49 cents per yard-mile by contract. These figures are conclusive of the advantage, in the interests of economy, of abolishing the old system of road work and particularly so in view of the proximity to the brisk industrial centres of Kitchener, Galt, Preston, Elmira and Hespeler, whose calls upon the labour market have constituted an argument against the abolition of statute labour.

TORONTO, June 21st, 1922.

W. A. McLEAN, Esq.,
Deputy Minister of Highways, Ontario.

SIR:

I herewith submit a report on work carried out on County Roads during the year 1921, within the Counties of Dufferin, Grey, Halton, Simcoe and Wellington.

All of which is respectfully submitted,

H. A. LUMSDEN,
District Engineer of Municipal Roads.

COUNTY OF GREY

Though one of the last counties to come under the Highway Improvement Act, this county has made steady and great progress since adopting the system in 1918.

A policy was adopted of constructing either waterbound macadam, or gravel roads with all reasonable speed and they have adhered to this, with a result that up to the end of 1921, out of the 68 miles of Provincial County Roads, 36 miles have been built and it is confidently expected that by the end of 1922 not less than 50 miles will be completed; this includes Suburban Roads.

Three complete outfits were at work throughout the year on Provincial County Roads, with the result that 8 miles of macadam road, 18 feet wide, were built in addition to 37 culverts, at a cost of approximately \$110,000, the somewhat high costs being necessitated by unusual construction difficulties in going through low-lying land, purchasing extra right-of-way, diversions, etc. Grades have been reduced to a maximum of 8 per cent, involving the cutting and straightening of two very steep hills at a cost of \$32,808.75. In addition six bridges were built.

On County Roads the progress has necessarily been somewhat slower, but throughout the season one outfit was continuously at work between Rock Mills and Priceville, where 7 miles of gravel road was built at a cost of \$41,839.80. Five bridges were also built on County Roads. The concentration of work on the most important roads has necessarily created some restlessness in townships where no work was in progress but with a little patience on their part the roads will be built, and a continuous and better system of roads will result.

As an instance of the great benefits to be derived, the 22 miles (Meaford to Owen Sound) could hardly be made in less than two hours with a car previous to construction, while now, though four miles yet remain to be built, the trip seldom takes more than an hour. In this con-



GREY COUNTY ROAD

18-foot concrete pavement—Provincial County Road, near Meaford.

nection it might be mentioned that the urgent need of regulations and control of bus services as to speed and load is very evident and already the roads are getting damaged through the fast travel of heavy motor vehicles in wet weather.

The maintenance of the roads has been for the most part fair, though in a few instances more might be done. The failure to use the drags at the right time or of the local overseer to be thoroughly interested in his work would account for most of the trouble where lack of maintenance is noticed.

Suburban Roads

This is the first year of operation by the Suburban Area Commission and \$14,384.41 was spent on new machinery. They have taken hold of the work well, and during the year much was accomplished. One and a half miles of water bound macadam were built, a bad swamp filled in on the Shallow Lake road and considerable hill cutting and grading was done as well as maintenance. The mileage taken over, 44 miles, is altogether too great, ranking second only to Toronto.

Township Work

Of the sixteen townships all but Sarawak received aid under the Ontario Highways Act. Of these, two have abolished and two have commuted statute labour, and where this has been done the work is inclined to show an improvement over the work of other townships. Over \$130,000 was expended on work by the sixteen townships. While considerable improvement has been made there remains much room for improvement. Better bridges should be built according to properly prepared plans and the roads should be widened and the drags used more frequently.

DUFFERIN COUNTY

While considerable work was done by this county during the year, the greatest work was more in organizing for the future than in immediate construction. During the year, the county, through the report of a special committee, decided to change from a Township to a strictly County Road System. This marks probably the greatest accomplishment for the year and provides every reason to hope that in the future better results will be obtained than in the past. During the year five bridges were built, one on Provincial County and four on County Roads, the largest being one of 50-foot span built at a cost of \$5,875.00. No extensive road construction was undertaken during the year, construction expenses being confined to a little widening and filling of swamps, hill cutting and a number of culverts.

Township Work

All six townships retain statute labour, and under these conditions work cannot be carried on with much efficiency. A growing interest in highway work is, however, very noticeable. Road superintendents were appointed by Mulmur, Melancthon and East Luther.

HALTON COUNTY

In area this is the second smallest of all counties in Ontario, containing but 228,396 acres of assessed property. Its total assessment (1919), however, was \$17,177,210, which ranks comparatively high despite the fact that the largest of its towns has only a population of 2,880.

This county first came in under the Highway Improvement Act in 1904, and has since endeavoured to improve all its County Roads. Where local material was available this has been accomplished, but some stretches yet remain to be built in the townships of Trafalgar and Esquesing. Unfortunately, as the life of a macadam road is very limited, a large number of roads built with aid from the Department already require reconstruction. Had a patrol system been in force since their construction many more years of life would have been got out of the roads.

There are 139 miles of road on the County Road System of which 130 miles are surfaced, consisting of 4.5 miles of cement concrete, 100.5 miles of waterbound macadam and 24 miles of gravel.

The outstanding feature of construction work in this county during 1921 was the laying of four miles of concrete pavement on Provincial County Road No. 71. The chief condition which influenced the county in building this type of road was the entire lack of material in the township of Trafalgar, necessitating a haul of from one to five miles from the nearest railway. The road was graded to a width of 28 feet, and the bridges widened. The pavement consists of one course concrete $5\frac{1}{2}$ to 7 inches thick and 10 feet wide laid in the centre of the road, on each side of which is a three-foot shoulder of macadam. The concrete was poured in 50-foot sections except towards the north end where the sections were made 30 feet in length. No reinforcing was used. Exclusive of the bridges the cost of this work amounted to \$23,650 per mile. The concrete was laid by contract, the unit price for the slab being \$3.10 per square yard. So far, the road gives every indication of being satisfactory. It is the intention to consolidate and widen the shoulders this coming season.

Approximately seven and a half miles of waterbound macadam road were constructed at an average cost of \$7,950 a mile. Several long stretches of road were stoned without rolling at a cost of \$3,600 per mile. Four small bridges were built during the year. Eighty-five per cent. of the bridges on County Roads have now been built. The bridge work, however, cannot be said to be quite as good as in some other parts of the county, neither the finish nor the concrete itself being entirely satisfactory. The township system of carrying on County Road work is not in the best interest of the road system. The class of work is far from consistent, good and poor work being found close together. For instance, stone being put on the road unrolled is poor practice.



DUFFERIN COUNTY

Concrete truss bridge in township of East Garafraxa, consisting of two spans each 80 feet long.

Township Work

All four townships in this county are receiving grants from the Department and all have appointed road superintendents. Nelson is the only one, however, which seemed to be carrying out its work in accordance with the intention of the Act. The other three did not give their superintendent a sufficiently free hand or endeavour to keep him in touch with the work of the whole township. Statute labour doubtless accounts for much of this trouble, as only in Nelson has it been commuted.

A meeting held at Milton on January 11th, 1922, which was attended by the township road superintendents, reeves and deputy reeves, is worthy of note. All subjects pertaining to township work were discussed and considerable interest was shown, and it is hoped that more uniformity of work may result.

The township of Nelson constructed approximately three-quarters of a mile of waterbound macadam and a similar length of gravel road during the year. One bridge 26-foot span was built by the township of Nassagaweya.

SIMCOE COUNTY

This county commenced operations under the Highway Improvement Act in 1903. It has an assessed area of nearly a million square miles and the designated road system has a length of 461 miles, exclusive of 53 miles of Provincial Highway. In this respect it ranks second of all the counties.

Constant maintenance and a certain amount of construction have effected a great improvement in the roads, but there remains much to be done. At the present time the designated roads (exclusive of Provincial Highways) are made up of the following types:

Earth Roads 20%	Gravel 77%	Stone 2%	Other Types 1%
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During the past year the county and townships suffered severely from heavy storms during April and May which carried away many bridges (mostly old) and left the roads in bad shape, particularly in the southern portion of the county.

The outstanding feature of county work in 1921 was the construction of six bridges on Provincial County Roads, the largest of which, Hamel's Bridge, near Beeton, has a span of 60 feet; this was commenced in 1920. Seven bridges were also built on County Roads, the largest being one at Elmvale of 30-foot span with 20-foot roadway, built at a cost of \$4,934.32.

On road construction the only work calling for special mention is the tar penetration surface put on the road between Penetang and Midland at a cost of \$7,000 per mile. Between Orillia and Atherly a macadam road was built 20 feet in width and the surface treated with tar. The work was well done. Considerable improvement was effected on the Penetang road, also on the big sand hill north of Barrie on the Elmvale road, while on the newly designated Provincial County Road, east of Singhampton, a road diversion has eliminated a most dangerous hill.

In the towns and villages probably the best work was done on the Lake Shore road in the town of Collingwood, where a gravel road was built and given a light coat of oil. In Barrie a good stretch of macadam road was built.

The roads were maintained throughout the season in fairly good shape.

Township Work

Of the sixteen townships in this county, eight are taking advantage of the 20 per cent subsidy, the remainder receiving Colonization Roads Aid.

A number of permanent bridges were built, particularly by the township of West Gwillimbury, where seven bridges were constructed at a cost of a little over twelve thousand dollars. The work carried out in the township of Nottawasaga was most satisfactory. The townships of Tecumseh, Essa and Flos have abolished statute labour, and a similar tendency is noticeable among the other townships. Township road superintendents were appointed by Nottawasaga, Flos, Tecumseh, West Gwillimbury and Tossorontio.

WELLINGTON COUNTY

This county has been doing work under the Highway Improvement Act since 1903. Their policy in recent years has been to concentrate on the building of permanent structures, and during the year approximately forty thousand dollars was spent thereon. No extensive road construction was undertaken but several short stretches of road were graded to the standard width and gravelled. The maintenance has been well attended to, better than in many near-by counties and particularly where the patrol system has been adopted excellent results have been obtained. The total designated mileage of road, including the 87 miles of Provincial Highways, show the following types:

Concrete, 4 miles; bituminous, 6 miles; stone, 13 miles; gravel, 367 miles; earth, 35 miles. The township roads also show over 45 per cent. of their road mileage to have been gravelled. It is estimated that 85 per cent. of the bridges and culverts on County and Provincial Count:



BRUCE COUNTY ROAD

Construction of gravel road through a swampy country, on commencement of work and after completion.

Roads have now been constructed. The only unfavourable feature connected with the fourteen bridges built during the year is that the finish in several cases was very rough.

Township Work

The chief factor against the township doing effective and efficient work is that, with the exception of Guelph, all retain statute labour and only four out of twelve have appointed township road superintendents. Considerable work, however, was accomplished. Approximately \$100,000 was spent by the twelve townships and grants totalling \$19,348.49 were received from the Province. The township to accomplish most was West Garafraxa, which built four bridges costing almost \$14,000 (one of which is not yet completed). Altogether 24 bridges were built by seven townships, the aggregate cost being about \$42,000.

The condition of the township roads varied from a first-rate gravel road to an almost impassable mud track, and while a certain amount of improvement is taking place no decided benefits can be expected till the statute labour system is abolished.

TORONTO, April 15th, 1922.

W. A. McLEAN, ESQ.,
Deputy Minister of Highways, Ontario.

SIR:

I have the honour to submit a summary report of the road work carried out under the Highway Improvement Act and the Ontario Highways Act during 1921 in the counties of Brant, Haldimand, Lincoln, Norfolk, Welland and Wentworth.

These counties all showed considerable increase in their road building programme during 1921, as is borne out by the fact that their combined expenditure for road purposes was in excess of two million dollars, exclusive of what they contributed to Provincial Highway construction and what the townships spent individually on their township roads.

From observations of previous years' work, a general improvement in the standard of work is noticeable, and more systematic maintenance is being undertaken.

Several townships were added to those taking aid from the Department, and in those where statute labour is abolished a very marked improvement is seen in the standard of their work. The officials also report that much more is being accomplished per dollar expended than under the old system. Many townships now have their work under the supervision of a township superintendent.

Respectfully submitted,

J. H. HAWES,
District Engineer of Municipal Roads.

BRANT COUNTY

The expenditure on the county road system in Brant during 1921 exceeded by a considerable amount that of any preceding year since the county adopted the system. This was partly due to the purchase by the county of the Brantford-Oakland Toll Road and the immediate undertaking of a considerable expenditure thereon. The purchase price was \$23,000. The road was later designated a Provincial County Road and assumed by the Brantford Suburban Roads Commission.

The County Road System at present consists of approximately one hundred and two miles of road of which 78 miles are gravel, $2\frac{1}{2}$ miles concrete, 2 miles tar penetration, and $19\frac{1}{2}$ miles earth. The total mileage of roads of all classes in the county is approximately 620 miles, and of this, 300 miles have a metalled surface of some kind, 270 miles of which is gravel.

BRANTFORD SUBURBAN ROADS

There are nineteen miles of road under the jurisdiction of the Brantford Suburban Roads Commission. The largest item of construction during the past summer consisted of the improvement of about two miles on the Burford Road beginning at the railway crossing just west of the city. A thirty-foot grade was established throughout, with adequate drainage. Some slight changes in alignment were made with a view to eliminating or improving the curvature and improving the visibility. For this purpose, it was necessary at a few points to acquire some additional right-of-way. A concrete pavement 9 feet wide and 8,625 feet long was laid on the north side of the road. The pavement is 7 inches thick and was laid by day labour at a cost of \$2.93 per square yard. A 9-foot strip of gravel was put down alongside the concrete on the south side of the road. This arrangement was somewhat in the nature of an experiment, the contention being that the concrete would carry probably 90 per cent. of the traffic, the gravel being called upon to take care of the turn-out traffic. Observation during 1922 will no

doubt prove whether this scheme should be adopted or not, and if it works out as anticipated, it will enable the county to provide twice the mileage of concrete pavement.

On the Cockshutt Road it is proposed to replace the existing wooden trestles with concrete box culverts and earth fills. The culverts are completed and the first fill, consisting of about 12,000 cubic yards, is almost completed. The northern approach to the Grand River bridge was strengthened, and a new wooden floor with a tar surface put on.

Provincial County Roads

One-half mile of heavy grading was done just east of Burford Village. The grade was raised an average of two feet and widened to 28 feet. Seven-eighths of a mile of twenty-eight-foot grade was established in the township of Oakland, and one mile of similar grade in the township of Dumfries across lots 10, 11 and 12, on Road No. 103. These grades are good examples of Provincial County Road work.

County Roads

Approximately four and one-half miles of road were graded to the standard width on various county roads, with side ditches and entrance culverts complete. In addition to the mentioned work, approximately $4\frac{1}{2}$ miles of tile drain and 40 pipe culverts were laid.

Bridges

One bridge was built during the year in the township of Oakland at the south end of the Cockshutt road. This is of reinforced concrete, 12-foot span, and 20-foot roadway. Owing to the nature of the soil, 16-foot tamarack piles were used to support the bridge.

Maintenance

The chief items of expenditure for maintenance were for gravelling and dragging; \$24,176.39 was spent on resurfacing county roads, and \$3,185.32 on dragging. On the gravel roads, a tractor and grader were used for dragging operations, and these roads were kept in splendid condition during the season.

Machinery

This county had quite a large outlay for new machinery during the year, the chief units being: three stone crushers, one $3\frac{1}{2}$ -ton motor truck, one 12-ton road roller, one waggon loader, one concrete mixer and one steam shovel. A suitable house has been erected for the storing of machinery during the winter months.

Township Work

Of the townships in Brant County, one has abolished statute labour, two have commuted it, and two are on a statute labour basis. The township of Burford was the most active of any in the county with an expenditure of approximately \$22,000.00. Some very good work was accomplished under Mr. F. W. Lewis, the superintendent. Work in the remaining townships consisted of the replacing and repairing of culverts, grading and gravelling of short stretches of road.

HALDIMAND COUNTY

No extensive programme of construction was undertaken in Haldimand County during 1921. Over 40 miles of the county system were graded and ditched to the county road standard, in preparation for a surface of some sort in the future. The extensive grading work done this year should prove to be a decided improvement to the system. The alignment of the grade in many instances was greatly improved, as was the drainage in all cases.

The road from Hagersville to Selkirk, a distance of $10\frac{1}{2}$ miles, was resurfaced with crushed stone and is at present in splendid condition. A similar surface was put on Road No. 10, from Nelles' Corners to its junction with Road No. 7, a distance of about one mile. Several smaller jobs of resurfacing were done on various macadam roads, particularly on the Rainham road, the river road between Cayuga and Caledonia, the road leading eastward from York village and the Nanticoke Road. An expenditure of approximately \$3,700.00 was made on the dragging of earth and gravel roads, which were kept in comparatively good condition.

A grant of \$5,500.00 was made to the village of Hagersville for a bituminous surface on the main street, a connecting link of the County Road system.

No bridges were built during the year, but 207 pipe and tile culverts were put in throughout the system, and two concrete box culverts were constructed. Many others were lengthened to conform to the new grades.

The detour traffic from the Provincial Highway which was under construction through the county caused a heavy strain on some of the county roads and made the maintenance charges rather high on those roads.

Township Work

All the townships in the county except Rainham, Dunn and Sherbrooke took advantage of the 20 per cent. grant from the Province this year. Of the ten townships, four have abolished statute labour, one commuted, and five still retain statute labour. In most of the town-

ships a decided interest is being taken in their roads and for the most part conscientious work is being done. The townships of Oneida, Seneca, and Walpole had township road superintendents in charge of their work, and appeared well satisfied with the results.

LINCOLN COUNTY

The county road system of Lincoln at present consists of approximately 175 miles, of which approximately 100 miles have received a surface of some sort, chiefly of waterbound or tar macadam. A limited supply of gravel is obtained along the southern shore of Lake Ontario and a few miles of road have had a surface of gravel. The clay roads are in excellent condition, being constantly dragged. At the end of 1921 there were 14 miles of gravel roads, 58 miles of waterbound macadam, 22 miles of bituminous penetration, and $4\frac{1}{2}$ miles of concrete roads completed on the system.

ST. CATHARINES SUBURBAN ROADS

The suburban roads are under the supervision of Mr. W. P. Near, and the season's work consisted of 2.0 miles of concrete road, 18-foot wide, on Niagara street, and 1,800 feet of 9-foot concrete pavement on the mountain section of the Merrittville road. One-half mile of asphaltic concrete was also laid on Niagara street, connecting with the city pavement. A 20-foot span reinforced concrete bridge was built on the Martindale road over Martindale pond, with a clear width of roadway of twenty feet.

County Roads

On the country roads, 3 miles of tar macadam were built, 16 feet wide. Sixteen miles of waterbound macadam 10 feet wide were built in various parts of the county, and 3 miles of gravel were built on the lake shore road between Port Dalhousie and Niagara-on-the-Lake. Three bridges were built, one 12-foot span on Lot 1, Concession 1, Grantham; one 28-foot span on the Creek Road; and one 54-foot span over the Four-Mile Creek on the lake shore road, the expenditure on the three bridges being \$11,446.65. The average cost for penetration roads was approximately \$19,500.00 per mile for a 16-foot road. The work done by day labour was approximately \$500.00 per mile cheaper than that done by contract. The average cost for the 10-foot waterbound macadam, including grading and ditching, was \$8,560.00 per mile.

Maintenance

A well organized patrol system is in operation in this county. On the twenty miles of bituminous roads in the system, one gang consisting of three men, a team and light waggon, a tar kettle and the necessary tools, are engaged in keeping these roads in repair. The foremen of the various divisions throughout the county are furnished with stamped and addressed envelopes, one of which they mail to the superintendent weekly, with a brief report of work done, and asking for any supplies required or calling to his notice any matter which needs his personal attention.

Township Work

Every township in this county has abolished statute labour, and the work in all except the township of Niagara is under the direction of a road superintendent. Generally speaking, the work is above the average standard for the district, probably due to the fact that they have been working longer under the present system than those in other localities. The townships bordering on Lake Ontario have a problem in the protecting of the bank of the lake front road and are undertaking to protect it by running short jetties out into the lake. Where the experiment has been tried the results have been very gratifying, erosion being practically eliminated.

NORFOLK COUNTY

A total of \$435,800.20 was spent on the Norfolk County Road System in 1921, as compared with \$174,696.35 in 1920, which is an indication of the increased activity in road work in this county during the past year. The total for construction was \$165,159.32, and for maintenance \$140,288.73.

Provincial County Roads

The chief item of construction was the completion of the 18-foot penetration road between the town of Simcoe and the village of Port Dover, a stretch of approximately $3\frac{1}{2}$ miles. This gives a continuous hard surface between these two municipalities. Approximately \$8,500.00 was spent on the maintenance of provincial county roads, chiefly on grading and resurfacing.

County Roads

Approximately nine miles of road were graded 24 feet between the shoulders, and 7 miles of this received a metalled surface. From Vanessa Station on the T., H. & B., westerly and southerly, four miles of gravel 14 feet wide and 12 inches deep, was laid. The gravel for this was

crushed, screened, rolled and watered, as for waterbound macadam. On County Road No. 9, running westerly from Port Rowan, $1\frac{1}{2}$ miles of tar penetration road was built, and on Road No. 8, 0.85 miles of stone base, 6 inches consolidated, was laid in preparation for a tar penetration surface.

Bridges

The bridge expenditure for the year was exceptionally heavy, chiefly by reason of the extensive type of bridge which the county was called upon to build over the River Lynn at Port Dover. A 55-foot bascule bridge was built here, with a 16-foot roadway and a 6-foot sidewalk. The counter weight and mechanism for lifting the bridge are encased in the east abutment, making a very neat design for this type of bridge. The total cost was \$77,344.66. A seventy-six-foot steel bridge with a 16-foot roadway, with concrete floor and abutments, known as the Dowell bridge, was built over Big Creek, the total cost being \$17,763.00. A smaller bridge of reinforced concrete, 10-foot span, known as the Ransom bridge, was built on Road No. 8, at a cost of \$1,154.00.

Machinery

The total cost of machinery purchased during 1921 was \$24,784.20. The larger items included five graders, two motor trucks and one gasoline shovel.

Township Work

With the exception of the township of Townsend, the townships in Norfolk County are not showing the interest in their roads that is generally in evidence throughout the district. This township abolished statute labour at the spring session of the council and appointed a township superintendent. Approximately 35 miles of grading of a good standard for township work was completed, and many culverts lengthened or replaced to conform to the new grades. For its first season under the new system this township made an excellent showing. In the remaining townships, the work was confined to the ordinary statute labour assessed on the ratepayers, along with the special work such as the building of a few bridges and culverts.

WELLAND COUNTY

As in most of the counties in this district, the road programme for 1921 was the largest in the history of the county, the total expenditure for the year being \$475,803.23. Approximately 17.5 miles of roads were added to the county system during the year, making the county road mileage 136 miles, exclusive of 5 miles of Welland suburban roads, and $5\frac{1}{4}$ miles of Niagara Falls suburban roads. Of the 136 miles of county roads, 2 miles are gravel, 80 miles are macadam, 0.5 miles concrete, 8.5 miles bituminous macadam, and 45.0 miles earth. From this it will be seen that 67 per cent. of the county roads have been surfaced. Of the 34 miles of provincial county roads, 28 miles are surfaced.

Provincial County Roads

On the Garrison Road between Fort Erie and the road leading into Ridgeway, 5.93 miles of tar penetration road 16 feet wide was completed. The contract price for the last 2.7 miles completed in 1921 was \$18,000.00 per mile, including grading and ditching. On the same road 6.8 miles of waterbound macadam was completed between Port Colborne and Marshville. This was built 16 feet wide and 9 inches deep consolidated.

County Roads

On the county roads, 2.6 miles of tar penetration road were built 16 feet wide. This is the Niagara Falls-Thorold road, from the end of Niagara Falls suburban road to the Thorold townline. Approximately 16.6 miles of waterbound macadam were built, 9 feet wide and 9 inches in depth, consolidated. Two miles of gravel road, 8 inches in depth, were laid in Pelham township. The total length of county road graded during the season was approximately 21 miles. A total of \$30,897.52 was appropriated in special grants to towns and villages for the improvement of streets forming connecting links or extensions to the county system. General maintenance was carried out throughout the system, the sum of \$58,793.26 being spent in the resurfacing of macadam roads, and \$8,000.00 on minor repairs. The main item of expenditure for equipment was the installation of electrical power in the Bethel quarry at a cost of \$2,500.00. This equipment has proved a splendid investment both as to efficiency and economy.

Welland and Niagara Falls Suburban Roads

On the suburban roads of Welland and Niagara Falls a total of \$36,039.25 was expended on construction and maintenance during the season, the chief item being the construction of 1.3 miles of tar penetration road, 16 feet wide, on the Thorold stone road for the Niagara Falls Suburban Roads Commission.

Township Work

The townships in Welland County have shown a marked improvement in their road systems, and in most cases are working up an efficient township road organization. All except one township are working under the supervision of a township road superintendent.

WENTWORTH COUNTY

In December, 1921, the county system in Wentworth consisted of 157 miles of County Roads and 37 miles of Provincial County Roads. The total road mileage in the county is approximately 620 miles, of which about 31 per cent. comes under the jurisdiction of the county. Only one mile of road was added to the system during the year. Of the total of 620 miles, about 44 per cent. of the roads have a hard surface and consist of gravel or waterbound macadam.

Out of an expenditure of \$252,942.92 during the season of 1921, only \$19,037.34 was expended on the construction of new roads, and \$5,063.22 on bridges and culverts. The total expenditure for maintenance and repair amounted to \$203,616.79. An analysis of these figures indicates an abnormally high maintenance charge, and in the opinion of the writer is a convincing argument in favour of some more permanent form of construction in this county, which, owing to its location at the head of Lake Ontario, is subjected to a converging traffic, with the city of Hamilton forming the centre. In order to cut down this excessive maintenance cost, a serious attempt should be made to place some form of pavement on the more heavily travelled roads radiating from Hamilton. It should be remembered, of course, that owing to the extensive programme of construction on the Hamilton entrances of the provincial highways, the other roads have been subjected to an abnormal detour traffic, from which they will be to a large extent relieved on the completion of the Provincial Highway. The only work of a permanent nature done by the county during the season was the construction of several concrete culverts ranging in span from 2 to 10 feet. The largest item of expenditure for maintenance was on the Hamilton Suburban Road between Stoney Creek and Hamilton, on which approximately \$32,000 was spent on resurfacing with crushed stone. The average per mile for maintenance of suburban roads was \$1,908.45. The expenditure on new machinery during the year was \$17,773.78, the more important purchases being a new 10-ton roller and a crusher and two bins and screens.

Township Work

The townships, with the exception of Glanford, all received Government aid on work done during the season, and on the whole did very creditable work, especially East Flamboro, Barton and Saltfleet. Their proximity to the city of Hamilton kept labour prices somewhat above the average in these townships, making the work considerably more expensive than in outlying districts. Four townships have abolished statute labour, one has commuted it and one partly commuted, while two townships are still operating under the statute labour system.

TORONTO, April 18th, 1922.

W. A. MACLEAN, ESQ.,
Deputy Minister of Highways, Ontario.

SIR:

I have the honour to submit a summary report on the improvement of the county roads during the year 1921 in District No. 7, which includes the counties of Hastings, Lennox and Addington, Frontenac, Leeds and Grenville, and Lanark, according to the provisions of the Highway Improvement Act.

During the year, in addition to the regular inspection, special visits were made at the request of the superintendents and county councils, and the advice and assistance of the Department was appreciated.

The cost of labour was greatly reduced and men were more plentiful than during the preceding years. More work of a better quality was obtained for the same outlay.

Waterbound macadam is the type of road most generally constructed in this district. The long dry spell during the early summer affected the usual convenient water supply, making good consolidation very difficult.

Respectfully submitted,

J. M. McINNES,
District Engineer of Municipal Roads.

HASTINGS COUNTY

The sum of \$71,501.63 was expended on Provincial County Roads, \$19,150.22 of this amount being spent on construction. In many cases the maintenance consisted in shaping the road with a grader, surfacing with crushed rock and consolidating with a roller. Provincial County Roads No. 22 and No. 87 pass through some very rough and rocky country, making construction both difficult and expensive. A great deal of narrow right-of-way is encountered, and until the necessary width is acquired and the fences and telephone poles moved, it will be impossible to build these roads to the required standard. That part of Road No. 22 from Bannockburn north to Bancroft is particularly rough and hilly. During the season \$29,553.40 was expended on this piece of road. The work consisted of securing better grades, widening cuts and fills,



HAMILTON-QUEENSTON PROVINCIAL HIGHWAY
Views of the road across Red Hill Creek, Saltfleet Township, before commencement
and after completion of pavement.

and surfacing with crushed rock or gravel. The method being followed is to pick out the difficult and dangerous points on the road and work on them. Steep grades, sharp turns and narrow rock cuts are quite common, many of which are being improved. This road should be carefully surveyed, so that the right location will be assured. It is expected that the traffic, particularly the summer tourist traffic, will increase as this road is improved. On Road No. 87 gravel is obtainable in several sections. Nine miles of Provincial County Road were graded.

On County Road construction \$40,363.05 were expended. This includes \$20,178.02 expended on four reinforced concrete bridges, and a retaining wall 65 feet long of reinforced concrete in the village of Stirling. Two bridges consisting of two 30-foot spans, 16-foot roadways, at a cost of \$10,931.40; one bridge of 40-foot span, 16-foot clear roadway, costing \$3,585.60; and one bridge of 30-foot span, 16-foot roadway, of reinforced concrete, at a cost of \$3,355.33 were built. Some 5¾ miles of road were graded and surfaced. The County Road between Cannifton and Corbyville was constructed of waterbound macadam 18 feet wide and the surface treated with oil. Approximately \$61,453.00 were expended on maintenance and repair of county roads, which consisted mostly in surfacing with gravel or crushed rock. Ditching, replacing and repairing culverts, dragging and patrol work were generally carried out. New machinery to the amount of \$23,134.48 was purchased, which included one complete crushing outfit, two rollers, one tractor and one grader.

Township Work

Four townships took advantage of the 20 per cent. grant. The work consisted mostly of surfacing with crushed rock or gravel. The township of Sidney built two reinforced concrete and steel bridges, one 20-foot span, one 25-foot span of 16-foot clear roadways. The township of Rawdon built three reinforced concrete bridges, one 20-foot span, one 30-foot span, and one 16-foot span, with 16-foot clear roadways. The township of Tyendinaga purchased a complete crushing outfit.

COUNTY OF LENNOX AND ADDINGTON

On the construction and maintenance of Provincial County Roads \$34,491.24 was expended. The outstanding feature of this work was the construction of a mile of road on Road No. 54 in South Fredericksburg. Extra right-of-way to give the required 66 feet was purchased, fences, telephone and telegraph lines were moved. The roadway was well graded and ample provision for drainage was made. The road is waterbound macadam, 16 feet wide and 10 inches deep. On Road No. 25 in the township of Richmond, 2½ miles were ditched and surfaced with crushed limestone which was not rolled. The maintenance consisted mostly in resurfacing with gravel or crushed stone. In several instances the crushed stone was watered and consolidated with rollers.

Approximately \$57,142.38 were expended on construction and maintenance of County Roads. In the township of Camden East, between Colebrook and Moscow, 3 miles were constructed at a cost of \$3,017.00. This was fairly well ditched and finished with the aid of a roller. The maintenance consisted mostly in resurfacing with gravel or crushed rock. The latter in many places was watered and rolled. One small reinforced concrete arch and one bridge of 50-foot span were constructed. The steel for the latter was originally used at Kayler's bridge on the Provincial Highway, and was given gratis to the county.

The narrow right-of-way, with poles carrying power, telephone or telegraph lines in the way of construction is quite common and is a hindrance to work being carried out in accordance with the regulations.

Township Work

Four townships took advantage of the twenty per cent. grant, the work consisting for the most part of resurfacing with gravel or crushed rock. The township of Camden built one bridge, 20-foot span, 16-foot roadway, of reinforced concrete and steel.

FRONTENAC COUNTY

The work on the Provincial County Roads was confined to maintenance, consisting mostly of surfacing with crushed rock. A heavy grader drawn by a tractor and followed with a roller was used to repair macadam roads that had become rutted. In places where there was not enough material to make the crown of the road smooth, extra crushed rock was used. This appears to be an economic method in keeping a smooth surface. One reinforced concrete culvert was built and several narrow cuts and fills were widened.

On County Road work approximately \$55,986 were expended. This was divided between construction and maintenance. The construction consisted in widening cuts and fills, shaping the roads with a grader, and surfacing with crushed rock. Four reinforced concrete culverts were built, and numerous tile culverts were laid. The maintenance consisted in surfacing with crushed rock or gravel, and shaping the road with a grader, and followed with a roller. Where necessary, several culverts were lengthened or repaired.

Township Work

Three townships took advantage of the 20 per cent. grant, the work consisting mostly of surfacing with crushed rock.

UNITED COUNTIES OF LEEDS AND GRENVILLE

On the construction and maintenance of Provincial County Roads \$35,997.75 were expended. Provincial County Road No. 128 from Lombardy to Rideau Ferry was fairly well graded and partly surfaced with crushed rock and consolidated with the roller. This was rather a difficult road to construct. It was narrow, crooked, and several stretches of rock were encountered. The required right-of-way was obtained, and where rock was taken out, the material was crushed and used for surfacing. The road was straightened in many places. The work is to be completed in 1922. The work on Provincial County Road No. 129, running north from Brockville, consisted mostly in surfacing with crushed rock. Two reinforced concrete culverts were built, and one large corrugated iron pipe with end walls of concrete was put in.

On County Road work approximately \$260,000.00 were expended. Some very good grading was done, the drainage getting proper consideration. In all some \$160,000.00 were expended on road construction. Two bridges commenced last year were completed in 1921. Three new reinforced concrete bridges of 12, 14 and 16-foot spans and 24-foot clear roadways were constructed. Some \$28,500.00 were expended on new machinery, consisting of three water waggons, two rollers, one crusher, one steam tractor, one twenty-ton screen and bin, four spreader waggons, one scarifier, four small graders, eleven scrapers, and four drags.

The maintenance and repair consisted mostly in surfacing with crushed rock, and rolling. Some places where the road was badly rutted the scarifier was used and the road shaped with a grader, and rolled.

Township Work

Nine townships took advantage of the 20 per cent. grant, the work consisting mostly in maintaining the roads with crushed rock or gravel.

LANARK COUNTY

The continuation of the construction of Provincial County Road No. 83, known as the Perth-Lanark Road, was the outstanding feature, this road being completed to the village of Balderson. The grading of this road was well done. The grade at Stanley hill was reduced and the material from the resulting cut was hauled both ways to widen the roadway, and 1,000 feet of tile were laid to take care of ground water. In this particular cut and in other places that were of a springy nature, excavations were made, then filled with large stones, and blind stone drains led from these to a free outlet. Two 4' x 6' x 28' reinforced concrete culverts were built. Fifteen concrete or corrugated iron pipe culverts varying from 12 to 24 inches in diameter were laid. The road consists of a 3-inch tar penetration surface 16 feet wide, laid on a 8-inch consolidated stone base. Two and one-quarter miles were constructed at a cost of \$39,231.44 or \$17,436.00 per mile. Fourteen and one-half miles of County Road were constructed at an average cost of \$3,750.10 per mile. This work consisted mostly of shaping the road with a grader and surfacing with crushed rock. Rock cuts were widened and the material where suitable was used for surfacing, or for widening fills. The Wymess cutoff on County Road No. 3, Bathurst Township, was completed. A 40-foot span bridge of reinforced concrete and steel was constructed at Maberly. On a part of the road between Carleton Place and Almonte, on Road No. 28, a base course was constructed with a view of laying a 3-inch tar penetration surface in the near future. \$32,225.37 were expended on maintenance and repair of County Roads, which consisted mostly of resurfacing with crushed stone. A three-ton motor truck was purchased.

Township Work

Eight of the 24 townships took advantage of the 20 per cent. grant, work consisting mostly of maintenance by resurfacing with crushed rock. The township of Bathurst constructed a 30-foot span bridge, 16-foot clear roadway, of reinforced concrete and steel, over a branch of the Tay River.

MOTOR VEHICLES BRANCH

REPORT OF REGISTRAR OF MOTOR VEHICLES

W. A. McLEAN, ESQ.,
Deputy Minister of Highways, Ontario.

SIR,—I have the honour to submit the following statistics of the permits and licenses issued by the Motor Vehicles Branch during the year 1920.

These statistics show in detail the number of passenger cars, commercial vehicles, motor-cycles and chauffeurs located in each city and county, as well as the occupations of the owners and the horse-power, carrying capacity and other descriptions of the vehicles registered.

Respectfully submitted,

J. P. BICKELL,
Registrar of Motor Vehicles.

PASSENGER CARS REGISTERED

(According to Counties and Cities.)

Counties.		Cities.		Total.
Algoma.....	765	Sault Ste. Marie.....	1,040	1,805
Brant.....	1,571	Brantford.....	1,546	3,117
Bruce.....	3,398	.....	.....	3,398
Carleton.....	1,755	Ottawa.....	4,137	5,892
Dufferin.....	1,523	.....	.....	1,523
Dundas.....	1,321	.....	.....	1,321
Durham.....	1,611	.....	.....	1,611
Elgin.....	3,223	St. Thomas.....	1,101	4,324
Essex.....	5,721	Windsor.....	3,153	8,874
Frontenac.....	1,291	Kingston.....	1,106	2,397
Glenarry.....	605	.....	.....	605
Grenville.....	714	.....	.....	714
Grey.....	3,440	Owen Sound.....	640	4,080
Haldimand.....	2,225	.....	.....	2,225
Haliburton.....	160	.....	.....	160
Halton.....	2,037	.....	.....	2,037
Hastings.....	3,160	Belleville.....	765	3,925
Huron.....	4,008	.....	.....	4,008
Kenora.....	96	.....	.....	96
Kent.....	5,655	Chatham.....	1,337	6,992
Lambton.....	3,395	Sarnia.....	997	4,392
Lanark.....	1,837	.....	.....	1,837
Leeds.....	2,333	.....	.....	2,333
Lennox & Addington.....	1,450	.....	.....	1,450
Lincoln.....	1,884	St. Catharines.....	1,158	3,042
Manitoulin.....	574	.....	.....	574
Middlesex.....	4,570	London.....	3,696	8,266
Muskoka.....	611	.....	.....	611
Nipissing.....	758	.....	.....	758
Norfolk.....	2,133	.....	.....	2,133
Northumberland.....	2,376	.....	.....	2,376
Ontario.....	3,101	.....	.....	3,101
Oxford.....	3,828	Woodstock.....	601	4,429
Parry Sound.....	671	.....	.....	671
Peel.....	2,030	.....	.....	2,030
Perth.....	2,897	Stratford.....	909	3,806
Peterboro.....	1,479	Peterboro.....	1,158	2,637
Prescott.....	816	.....	.....	816
Prince Edward.....	1,520	.....	.....	1,520
Rainy River.....	494	.....	.....	494
Renfrew.....	1,989	.....	.....	1,989
Russell.....	526	.....	.....	526
Simcoe.....	5,151	.....	.....	5,151
Stormont.....	1,424	.....	.....	1,424
Sudbury.....	1,067	.....	.....	1,067
Thunder Bay.....	221	Fort William.....	845	.....
.....	.....	Port Arthur.....	579	1,645
Temiskaming.....	684	.....	.....	684
Victoria.....	2,048	.....	.....	2,048

Counties.		Cities.		Total.
Waterloo.....	3,116	Galt.....	759	
Welland.....	2,964	Kitchener.....	1,393	5,268
Wellington.....	2,811	Niagara Falls.....	1,226	
Wentworth.....	2,573	Welland.....	825	5,015
York.....	5,404	Guelph.....	976	3,787
Foreign.....		Hamilton.....	6,662	9,235
		Toronto.....	32,063	37,467
			.....	292
	113,014		68,672	181,978

PASSENGER CARS REGISTERED ACCORDING TO OCCUPATIONS

Farmers.....	64,045
Merchants.....	16,700
Tradesmen.....	23,680
Professional.....	6,748
Manufacturers.....	4,820
Doctors.....	3,934
Livery and garages.....	5,187
Commercial travellers.....	5,311
Firms.....	2,623
Real estate agents.....	1,098
Cartage agents.....	532
Insurance agents.....	1,190
Agents.....	5,408
Contractors.....	2,961
Undertakers.....	406
Clerks.....	3,969
Laborers.....	4,059
Managers.....	8,018
Police.....	303
Drovers.....	651
Soldiers.....	114
Unoccupied.....	11,369
Unclassified.....	7,985
Municipal corporations.....	212
Public Utilities Commission.....	130
Banks.....	142
Railways.....	17
Dominion Government.....	155
Ontario Government.....	204
Hospitals.....	7
	181,978

PASSENGER CARS REGISTERED ACCORDING TO POWER

Horse Power		
Fords, 22.5.....	88,150	
15.....	154	
16-20.....	24,895	
21-25.....	43,993	
26-30.....	20,164	
31-35.....	2,394	
36-40.....	1,550	
41-45.....	382	
46-50.....	154	
51 up.....	16	
Electric.....	126	
		181,978
Motive Power		
Gasoline.....	181,850	
Electric.....	126	
Steam.....	2	
		181,978
Registrations		
Originals.....	28,513	
Renewals.....	153,465	
		181,978

Classifications of Models

Touring cars.....	154,652	
Runabouts.....	11,293	
Coupes.....	6,887	
Sedans.....	9,030	
Taxicabs.....	86	
Busses.....	30	
		181,978

COMMERCIAL CARS REGISTERED

Counties.		Cities.		Total.
Algoma.....	70	Sault Ste. Marie.....	149	219
Brant.....	112	Brantford.....	284	396
Bruce.....	95	.....	.....	95
Carleton.....	82	Ottawa.....	705	787
Dufferin.....	32	.....	.....	32
Dundas.....	42	.....	.....	42
Durham.....	51	.....	.....	51
Elgin.....	88	St. Thomas.....	124	212
Essex.....	559	Windsor.....	616	1,175
Frontenac.....	67	Kingston.....	129	196
Glengarry.....	17	.....	.....	17
Grenville.....	44	.....	.....	44
Grey.....	78	Owen Sound.....	76	154
Haldimand.....	116	.....	.....	116
Haliburton.....	10	.....	.....	10
Halton.....	244	.....	.....	244
Hastings.....	127	Belleville.....	122	249
Huron.....	149	.....	.....	149
Kenora.....	28	.....	.....	28
Kent.....	181	Chatham.....	194	375
Lambton.....	63	Sarnia.....	136	199
Lanark.....	88	.....	.....	88
Leeds.....	193	.....	.....	193
Lennox and Addington.....	69	.....	.....	69
Lincoln.....	310	St. Catharines.....	297	607
Manitoulin.....	1	.....	.....	1
Middlesex.....	198	London.....	679	877
Muskoka.....	40	.....	.....	40
Nipissing.....	103	.....	.....	103
Norfolk.....	122	.....	.....	122
Northumberland.....	154	.....	.....	154
Ontario.....	245	.....	.....	245
Oxford.....	175	Woodstock.....	88	263
Parry Sound.....	34	.....	.....	34
Peel.....	239	.....	.....	239
Perth.....	104	Stratford.....	102	206
Peterboro.....	59	Peterboro.....	145	204
Prescott.....	33	.....	.....	33
Prince Edward.....	93	.....	.....	93
Rainy River.....	34	.....	.....	34
Renfrew.....	84	.....	.....	84
Russell.....	25	.....	.....	25
Simcoe.....	292	.....	.....	292
Stormont.....	52	.....	.....	52
Sudbury.....	22	.....	.....	22
Thunder Bay.....	28	Fort William.....	162	
		Port Arthur.....	101	291
Temiskaming.....	70	.....	.....	70
Victoria.....	112	.....	.....	112
Waterloo.....	191	Galt.....	116	
		Kitchener.....	199	506
Welland.....	323	Niagara Falls.....	201	
		Welland.....	95	619
Wellington.....	66	Guelph.....	118	184
Wentworth.....	334	Hamilton.....	1,126	1,460
York.....	813	Toronto.....	6,187	7,000
Foreign.....		.....	.....	442
	6,961		12,151	19,554

COMMERCIAL CARS ACCORDING TO OCCUPATIONS

Farmers.....	1,859
Merchants.....	4,924
Tradesmen.....	1,108
Professional.....	30
Manufacturers.....	1,062
Doctors.....	7
Livery and garages.....	535
Commercial travellers.....	51
Firms.....	4,248
Real estate agents.....	13
Cartage agents.....	2,229
Insurance agents.....	11
Agents.....	359
Contractors.....	713
Undertakers.....	362
Clerks.....	37
Labourers.....	175
Managers.....	92
Police.....	22
Drovers.....	46
Soldiers.....	5
Unoccupied.....	329
Unclassified.....	378
Municipal Corporations.....	293
Public Utilities.....	312
Banks.....	2
Railways.....	47
Dominion Government.....	132
Ontario Government.....	161
Hospitals.....	12
	<hr/>
	19,554

COMMERCIAL CARS ACCORDING TO TONNAGE

1/2.....	2,163
1.....	13,863
1 1/2.....	1,286
2.....	956
2 1/2.....	237
3.....	197
3 1/2.....	330
4.....	68
4 1/2.....	19
5.....	281
5 1/2.....	10
6.....	10
6 1/2.....	2
7.....	1
Electric.....	50
Fire truck.....	81
	<hr/>
	19,554

Motive Power

Gasoline.....	19,500
Electric.....	50
Steam.....	4
	<hr/>
	19,554

Registrations

Originals.....	4,632
Renewals.....	14,922
	<hr/>
	19,554

Models

Busses.....	230
Delivery cars.....	4,002
Trucks.....	14,848
Ambulances.....	107
Hearses.....	239
Casket waggons.....	36
Patrols.....	11
Fire trucks.....	81
	<hr/>
	19,554

MOTORCYCLES REGISTERED

Counties.		Cities.		Total.
Algoma.....	21	Sault Ste. Marie.....	55	76
Brant.....	24	Brantford.....	57	81
Bruce.....	22	.....	.....	22
Carleton.....	32	Ottawa.....	185	217
Dufferin.....	14	.....	.....	14
Dundas.....	6	.....	.....	6
Durham.....	24	.....	.....	24
Elgin.....	20	St. Thomas.....	25	45
Essex.....	66	Windsor.....	66	132
Frontenac.....	8	Kingston.....	39	47
Glengarry.....	6	.....	.....	6
Grenville.....	3	.....	.....	3
Grey.....	23	Owen Sound.....	13	36
Haldimand.....	12	.....	.....	12
Haliburton.....	1	.....	.....	1
Halton.....	42	.....	.....	42
Hastings.....	10	Belleville.....	19	29
Huron.....	36	.....	.....	36
Kenora.....	4	.....	.....	4
Kent.....	21	Chatham.....	22	43
Lambton.....	28	Sarnia.....	19	47
Lanark.....	15	.....	.....	15
Leeds.....	23	.....	.....	23
Lennox and Addington.....	14	.....	.....	14
Lincoln.....	46	St. Catharines.....	35	81
Manitoulin.....	2	.....	.....	2
Middlesex.....	38	London.....	130	168
Muskoka.....	4	.....	.....	4
Nipissing.....	20	.....	.....	20
Norfolk.....	19	.....	.....	19
Northumberland.....	19	.....	.....	19
Ontario.....	72	.....	.....	72
Oxford.....	42	Woodstock.....	25	67
Parry Sound.....	8	.....	.....	8
Peel.....	45	.....	.....	45
Perth.....	26	Stratford.....	57	83
Peterboro.....	9	Peterboro.....	27	36
Prescott.....	9	.....	.....	9
Prince Edward.....	21	.....	.....	21
Rainy River.....	11	.....	.....	11
Renfrew.....	28	.....	.....	28
Russell.....	9	.....	.....	9
Simcoe.....	75	.....	.....	75
Stormont.....	16	.....	.....	16
Sudbury.....	2	.....	.....	2
Thunder Bay.....	6	Fort William.....	21	.....
.....	.....	Port Arthur.....	28	55
Temiskaming.....	19	.....	.....	19
Victoria.....	15	.....	.....	15
Waterloo.....	75	Galt.....	48	.....
.....	.....	Kitchener.....	39	162
Welland.....	65	Niagara Falls.....	69	.....
.....	.....	Welland.....	38	172
Wellington.....	30	Guelph.....	34	64
Wentworth.....	56	Hamilton.....	252	308
York.....	253	Toronto.....	2,167	2,420
Foreign.....	.....	.....	.....	4
1,515		3,470		4,989

MOTORCYCLES ACCORDING TO OCCUPATIONS

Farmers.....	428
Merchants.....	164
Tradesmen.....	2,413
Professional.....	103
Manufacturers.....	19
Livery and garages.....	245
Commercial travellers.....	76
Firms.....	34
Real estate agents.....	3
Cartage agents.....	13
Insurance agents.....	10
Agents.....	28
Contractors.....	26
Undertakers.....	1
Clerks.....	259
Laborers.....	457
Managers.....	65
Police.....	84
Drovers.....	1
Soldiers.....	16
Unoccupied.....	151
Unclassified.....	339
Municipal Corporations.....	21
Public Utilities.....	23
Banks.....	1
Dominion Government.....	5
Ontario Government.....	4
	<hr/>
	4,989

Registrations

Originals.....	433
Renewals.....	4,556
	<hr/>
	4,989

TRAILERS REGISTERED

Counties.		Cities.		Total.
Algoma.....	2	Sault Ste. Marie.....	2	2
Brant.....	2	Brantford.....	6	8
Bruce.....				
Carleton.....		Ottawa.....	1	1
Dufferin.....				
Dundas.....	1			1
Durham.....				
Elgin.....	2	St. Thomas.....	1	3
Essex.....	16	Windsor.....	26	42
Frontenac.....	1	Kingston.....		1
Flengarry.....				
Grenville.....				
Grey.....	3	Owen Sound.....	2	5
Haldimand.....	2			2
Haliburton.....				
Halton.....	7			7
Hastings.....		Belleville.....	1	1
Huron.....	26			26
Kenora.....				
Kent.....	20	Chatham.....	7	27
Lambton.....	16	Sarnia.....	3	19
Lanark.....	1			1
Leeds.....				
Lennox and Addington.....	2			2
Lincoln.....	1	St. Catharines.....	2	3
Manitoulin.....				
Middlesex.....	7	London.....	5	12
Muskoka.....				
Nipissing.....	1			1
Norfolk.....	10			10
Northumberland.....	2			2
Ontario.....	1			1
Oxford.....	3	Woodstock.....	1	4
Parry Sound.....				
Peel.....	2			2
Perth.....		Stratford.....		
Peterboro.....		Peterboro.....	1	1
Prescott.....				
Prince Edward.....				
Rainy River.....				
Renfrew.....				
Russell.....				
Simcoe.....	3			3
Stormont.....				
Sudbury.....		Fort William.....		
Thunder Bay.....		Port Arthur.....		
Temiskaming.....				
Victoria.....				
Waterloo.....	4	Galt.....	1	5
		Kitchener.....	3	3
Welland.....	6	Niagara Falls.....		6
		Welland.....		
Wellington.....	4	Guelph.....	1	5
Wentworth.....		Hamilton.....	8	8
York.....	10	Toronto.....	102	112
Foreign.....				1
	155		171	327

PASSENGER MOTOR CAR DEALERS REGISTERED

Counties.		Cities.		Total.
Algoma.....	3	Sault Ste. Marie.....	13	16
Brant.....	5	Brantford.....	17	22
Bruce.....	26	.....	.....	26
Carleton.....	7	Ottawa.....	49	56
Dufferin.....	14	.....	.....	14
Dundas.....	9	.....	.....	9
Durham.....	6	.....	.....	6
Elgin.....	12	St. Thomas.....	13	25
Essex.....	21	Windsor.....	17	38
Frontenac.....	4	Kingston.....	23	27
Glengarry.....	9	.....	.....	9
Grenville.....	6	.....	.....	6
Gray.....	25	Owen Sound.....	4	29
Haldimand.....	12	.....	.....	12
Haliburton.....	1	.....	.....	1
Halton.....	14	.....	.....	14
Hastings.....	26	Belleville.....	15	41
Huron.....	30	.....	.....	30
Kenora.....	4	.....	.....	4
Kent.....	37	Chatham.....	21	58
Lambton.....	22	Sarnia.....	9	31
Lanark.....	7	.....	.....	7
Leeds.....	17	.....	.....	17
Lennox and Addington.....	12	.....	.....	12
Lincoln.....	6	St. Catharines.....	16	22
Manitoulin.....	4	.....	.....	4
Middlesex.....	31	London.....	26	57
Muskoka.....	7	.....	.....	7
Nipissing.....	10	.....	.....	10
Norfolk.....	22	.....	.....	22
Northumberland.....	13	.....	.....	13
Ontario.....	43	.....	.....	43
Oxford.....	20	Woodstock.....	8	28
Parry Sound.....	8	.....	.....	8
Peel.....	11	.....	.....	11
Perth.....	13	Stratford.....	14	27
Peterborough.....	4	Peterboro.....	17	21
Prescott.....	8	.....	.....	8
Prince Edward.....	7	.....	.....	7
Rainy River.....	6	.....	.....	6
Renfrew.....	20	.....	.....	20
Russell.....	3	.....	.....	3
Simcoe.....	40	.....	.....	40
Stormont.....	10	.....	.....	10
Sudbury.....	12	.....	.....	12
Thunder Bay.....	.....	Fort William.....	6	.....
.....	.....	Port Arthur.....	4	10
Temiskaming.....	4	.....	.....	4
Victoria.....	12	.....	.....	12
Waterloo.....	13	Galt.....	11	.....
.....	.....	Kitchener.....	18	42
Welland.....	18	Niagara Falls.....	10	.....
.....	.....	Welland.....	10	38
Wellington.....	11	Guelph.....	13	24
Wentworth.....	14	Hamilton.....	60	74
York.....	36	Toronto.....	190	226
Foreign.....	.....	.....	.....	43
735		584		1,362

COMMERCIAL CAR DEALERS REGISTERED

Counties.		Cities.		Total.
Algoma.....	..	Sault Ste. Marie.....	..	..
Brant.....	..	Brantford.....	3	3
Bruce.....	..	.....	..	..
Carleton.....	..	Ottawa.....	4	4
Dufferin.....	..	.....	..	..
Dundas.....	..	.....	..	..
Durham.....	..	.....	..	..
Elgin.....	1	St. Thomas.....	1	2
Essex.....	6	Windsor.....	6	12
Frontenac.....	..	Kingston.....	2	2
Glengarry.....	..	.....	..	..
Grenville.....	1	.....	..	1
Grey.....	2	Owen Sound.....	..	2
Haldimand.....	..	.....	..	..
Haliburton.....	..	.....	..	..
Halton.....	2	.....	..	2
Hastings.....	1	Belleville.....	3	4
Huron.....	2	.....	..	2
Kenora.....	..	.....	..	..
Kent.....	2	Chatham.....	2	4
Lambton.....	1	Sarnia.....	2	3
Lanark.....	..	.....	..	..
Leeds.....	1	.....	..	1
Lennox and Addington.....	..	.....	..	..
Lincoln.....	..	St. Catharines.....	5	5
Manitoulin.....	..	.....	..	..
Middlesex.....	1	London.....	14	15
Muskoka.....	..	.....	..	..
Nipissing.....	..	.....	..	..
Norfolk.....	1	.....	..	1
Northumberland.....	1	.....	..	1
Ontario.....	4	.....	..	4
Oxford.....	1	Woodstock.....	..	1
Parry Sound.....	..	.....	..	..
Peel.....	1	.....	..	1
Perth.....	2	Stratford.....	2	4
Peterborough.....	..	Peterboro.....	1	1
Prescott.....	..	.....	..	..
Prince Edward.....	..	.....	..	..
Rainy River.....	..	.....	..	..
Renfrew.....	..	.....	..	..
Russell.....	..	.....	..	..
Simcoe.....	2	.....	..	2
Stormont.....	1	.....	..	1
Sudbury.....	..	.....	..	..
Thunder Bay.....	..	Fort William.....	1	..
Temiskaming.....	..	Port Arthur.....	..	1
Victoria.....	..	.....	..	..
Waterloo.....	1	Galt.....	..	1
Welland.....	3	Kitchener.....	3	3
Wellington.....	1	Niagara Falls.....	1	4
Wentworth.....	3	Welland.....	..	..
York.....	2	Guelph.....	1	2
Foreign.....	..	Hamilton.....	14	17
		Toronto.....	38	40
		.....	..	5
	43		103	151

MOTORCYCLE DEALERS REGISTERED

Counties.		Cities.		Total.
Algoma.....	..	Sault Ste. Marie.....	..	..
Brant.....	..	Brantford.....	..	..
Bruce.....	..	..	..	..
Carleton.....	..	Ottawa.....	..	..
Dufferin.....	..	..	..	..
Dundas.....	..	..	..	..
Durham.....	..	..	..	..
Elgin.....	..	St. Thomas.....	..	..
Essex.....	..	Windsor.....	..	..
Frontenac.....	..	Kingston.....	..	..
Glengarry.....	..	..	..	..
Grenville.....	..	..	..	..
Grey.....	..	Owen Sound.....	..	..
Haldimand.....	..	..	..	..
Haliburton.....	..	..	..	..
Halton.....	..	..	..	..
Hastings.....	..	Belleville.....	1	1
Huron.....	..	..	..	..
Kenora.....	..	..	..	..
Kent.....	..	Chatham.....	..	..
Lambton.....	..	Sarnia.....	..	..
Lanark.....	..	..	..	..
Leeds.....	..	..	..	..
Lennox and Addington.....	..	..	..	..
Lincoln.....	..	St. Catharines.....	..	..
Manitoulin.....	..	..	..	..
Middlesex.....	..	London.....	..	..
Muskoka.....	..	..	..	..
Nipissing.....	..	..	..	..
Norfolk.....	..	..	..	..
Northumberland.....	..	..	..	..
Ontario.....	1	..	..	1
Oxford.....	..	Woodstock.....	..	..
Parry Sound.....	..	..	..	..
Peel.....	..	..	..	..
Perth.....	..	Stratford.....	1	1
Peterborough.....	..	Peterboro.....	..	..
Prescott.....	..	..	..	..
Prince Edward.....	..	..	..	..
Rainy River.....	..	..	..	..
Renfrew.....	..	..	..	..
Russell.....	..	..	..	..
Simcoe.....	..	..	..	..
Stormont.....	..	..	..	..
Sudbury.....	..	..	..	..
Thunder Bay.....	..	Fort William.....	..	..
..	..	Port Arthur.....	..	..
Temiskaming.....	..	..	..	..
Victoria.....	..	..	..	..
Waterloo.....	..	Galt.....	..	..
..	..	Kitchener.....	..	..
Welland.....	..	Niagara Falls.....	1	1
..	..	Welland.....	..	..
Wellington.....	..	Guelph.....	2	2
Wentworth.....	..	Hamilton.....	2	2
York.....	..	Toronto.....	17	17
Foreign.....	..	..	..	5
	1		24	30

GARAGES REGISTERED

Counties.		Cities.		Total.
Algoma	31	Sault Ste. Marie.....	14	45
Brant	9	Brantford	27	36
Bruce	60	.....	..	60
Carleton	9	Ottawa.....	59	68
Dufferin	16	.....	..	16
Dundas	17	.....	..	17
Durham	20	.....	..	20
Elgin	29	St. Thomas	14	43
Essex	65	Windsor.....	45	110
Frontenac	8	Kingston.....	33	41
Glengarry	10	.....	..	10
Grenville	16	.....	..	16
Grey	50	Owen Sound.....	14	64
Haldimand	27	.....	..	27
Haliburton	4	.....	..	4
Halton	32	.....	..	32
Hastings	50	Belleville.....	18	68
Huron	61	.....	..	61
Kenora.....	17	.....	..	17
Kent.....	49	Chatham	40	89
Lambton.....	49	Sarnia	13	62
Lanark.....	27	.....	..	27
Leeds.....	39	.....	..	39
Lennox and Addington.....	28	.....	..	28
Lincoln.....	39	St. Catharines	20	59
Manitoulin .....	..	.....	..	..
Middlesex.....	53	London	58	111
Muskoka	27	.....	..	27
Nipissing.....	36	.....	..	36
Norfolk.....	25	.....	..	25
Northumberland.....	46	.....	..	46
Ontario.....	59	.....	..	59
Oxford.....	39	Woodstock.....	7	46
Parry Sound.....	21	.....	..	21
Peel.....	25	.....	..	25
Perth.....	26	Stratford.....	12	38
Peterboro.....	22	Peterboro	27	49
Prescott.....	18	.....	..	18
Prince Edward.....	18	.....	..	18
Rainy River.....	11	.....	..	11
Renfrew.....	38	.....	..	38
Russell.....	12	.....	..	12
Simcoe.....	91	.....	..	91
Stormont.....	13	.....	..	13
Sudbury.....	..	.....	..	..
Thunder Bay.....	..	Fort William.....	10	..
.....	..	Port Arthur.....	16	26
Temiskaming.....	22	.....	..	22
Victoria.....	28	.....	..	28
Waterloo.....	41	Galt.....	14	..
.....	..	Kitchener.....	19	74
Welland.....	23	Niagara Falls.....	8	..
.....	..	Welland.....	13	44
Wellington.....	36	Guelph.....	13	49
Wentworth.....	18	Hamilton.....	60	78
York.....	71	Toronto.....	360	431
Foreign.....	..	.....	..	..
1,581		914		2,495

CHAUFFEURS REGISTERED

Counties.		Cities.		Total.
Algoma.....	113	Sault Ste. Marie.....	247	360
Brant.....	91	Brantford.....	229	320
Bruce.....	181	.....	.....	181
Carleton.....	97	Ottawa.....	294	1,039
Dufferin.....	46	.....	.....	46
Dundas.....	42	.....	.....	42
Durham.....	95	.....	.....	95
Elgin.....	72	St. Thomas.....	182	254
Essex.....	351	Windsor.....	781	1,132
Frontenac.....	43	Kingston.....	146	189
Glengarry.....	41	.....	.....	41
Grenville.....	79	.....	.....	79
Grey.....	146	Owen Sound.....	194	340
Haldimand.....	84	.....	.....	84
Haliburton.....	22	.....	.....	22
Halton.....	161	.....	.....	161
Hastings.....	240	Belleville.....	197	437
Huron.....	289	.....	.....	289
Kenora.....	34	.....	.....	34
Kent.....	209	Chatham.....	217	426
Lambton.....	94	Sarnia.....	137	231
Lanark.....	144	.....	.....	144
Leeds.....	226	.....	.....	226
Lennox and Addington.....	107	.....	.....	107
Lincoln.....	101	St. Catharines.....	278	379
Manitoulin.....	62	.....	.....	62
Middlesex.....	112	London.....	790	902
Muskoka.....	96	.....	.....	96
Nipissing.....	135	.....	.....	135
Norfolk.....	85	.....	.....	85
Northumberland.....	246	.....	.....	246
Ontario.....	247	.....	.....	247
Oxford.....	186	Woodstock.....	123	309
Parry Sound.....	79	.....	.....	79
Peel.....	56	.....	.....	56
Perth.....	91	Stratford.....	101	192
Peterboro.....	68	Peterboro.....	193	261
Prescott.....	66	.....	.....	66
Prince Edward.....	110	.....	.....	110
Rainy River.....	73	.....	.....	73
Renfrew.....	103	.....	.....	103
Russell.....	14	.....	.....	14
Simcoe.....	395	.....	.....	395
Stormont.....	69	.....	.....	69
Sudbury.....	152	.....	.....	152
Thunder Bay.....	2	Fort William.....	117	195
.....	.....	Port Arthur.....	76	138
Temiskaming.....	138	.....	.....	138
Victoria.....	142	.....	.....	142
Waterloo.....	148	Galt.....	128	432
.....	.....	Kitchener.....	156	.....
Welland.....	315	Niagara Falls.....	266	.....
.....	.....	Welland.....	185	766
Wellington.....	65	Guelph.....	150	215
Wentworth.....	126	Hamilton.....	1,430	1,556
York.....	370	Toronto.....	7,606	7,976
Foreign.....	.....	.....	.....	78
	6,859		14,871	21,808

APPENDIX

SUMMARY,

Statement of Work and Expenditure

County	Work Done During Year							Roads and Culverts
	Miles Graded	Miles Stoned	Miles Gravelled	Tile Drain Rods	Bridges	Pipe and Tile Culverts	Other Culverts	
Brant.....	4.46	.....	.....	292	.....	37	.....	\$ c.
Bruce.....	3.75	.....	2.58	134	11	66	15	27,477 64
Carleton.....	19.59	10.00	15.83	950	14	61	20	57,760 18
Dufferin.....	0.30	0.30	.....	42	4	82	1	220,516 47
Elgin.....	0.52	93	3.34	385	1	20	2	15,261 00
Essex.....	.....	Concrete 4.09	.....	.....	.....	.....	.....	24,144 59
Frontenac.....	6.00	Bit. Mac. 0.45	3.00	.....	5	32	12	209,140 71
Grey.....	1.87	8.00	.....	.....	.....	36	6	28,796 87
Haldimand.....	34.50	1.05	7.00	.....	5	6	6	62,118 64
Halton.....	1.25	12.00	11.25	.....	.....	207	2	125,308 17
Hastings.....	1.00	15.25	0.50	.....	1	11	1	75,252 03
Huron.....	.....	1.75	3.00	.....	4	9	.....	20,185 03
Kent.....	1.00	.....	10.50	.....	4	.....	2	16,745 49
Lambton.....	0.31	Concrete 2.48	.....	4,231	3	9	3	85,146 27
Lanark.....	.....	.....	.....	111	3	23	13	18,792 99
Leeds and Grenville.....	4.75	14.50	5.00	.....	.....	28	5	54,376 58
Lennox and Addington.....	.....	28.50	.....	.....	3	73	4	160,012 81
Lincoln.....	5.20	3.00	.....	.....	2	.....	.....	9,051 11
Middlesex.....	19.62	16.24	.....	.....	.....	.....	.....	.....
Norfolk.....	3.82	Bit. Mac. 2.34	2.70	80	4	261	6	350,283 41
Northumberland and Durham.....	4.50	Asp. Concrete 0.50	.....	81	11	23	.....	31,463 94
Ontario.....	9.75	Bit. Mac. 1.50	4.00	545	3	29	.....	87,671 74
Oxford.....	.....	.....	10.00	.....	3	37	.....	26,638 33
Peel.....	6.05	.....	.....	4	3	20	18	21,179 97
Peterboro.....	.....	1.25	.....	.....	.....	.....	.....	.....
Prescott and Russell.....	5.95	Bit. Mac. 1.75	18.15	4,064	2	5	2	74,245 48
Prince Edward.....	2.25	3.86	22.07	.....	1	73	2	84,049 32
Renfrew.....	.....	0.34	50	392	3	14	2	64,48 06
Simcoe.....	.....	.....	2.26	.....	2	3	3	11,684 25
Stormont, Dundas and Glengarry.....	1.50	20.16	.....	.....	.....	.....	.....	.....
Victoria.....	0.51	5.25	6.62	35	11	48	27	454,980 99
Waterloo.....	.....	3.37	88	.....	.....	34	.....	20,665 08
Welland.....	6.12	6.20	31.30	12	6	127	25	187,754 39
Wellington.....	3.50	.....	.....	7	74	74	1	18,612 48
Wentworth.....	.....	33.25	.....	1	19	19	19	360,461 91
York.....	3.31	1.40	1.43	145	1	28	3	25,841 03
.....	.....	15.45	9.00	.....	1	14	7	70,404 98
.....	.....	3.86	2.00	14	.....	27	7	205,232 80
.....	.....	0.22	.....	14	4	10	10	9,715 51
.....	.....	15.67	.....	1,192	1	.....	2	19,037 34
.....	.....	7.10	9.70	15	3	81	18	455,114 31
.....	.....	Asp. Concrete 2.32	.....	.....	.....	.....	.....	.....
151.38		*247.47	182.83	12,724	137	1,621	244	3,731,571 90

* Includes—

W.B. Macadam.....	211.47	miles.
Concrete.....	10.31	do.
Bituminous Macadam...	22.87	do.
Asphaltic Concrete.....	2.82	do.

No. 1

1921

on County Road Construction

Approved Expenditure for Year

Bridges	Machinery and Repairs	Special Grants to Towns and Villages	Purchase of Toll Roads and Gravel Pits	Superin- tendence	Total Approved Expenditure on Con- struction	Total Approved Expenditure on Maintenance	Total Approved Expenditure	Government Grant 40 per cent.
\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
103 93	60,441 70	2,703 77	23,000 00	5,341 03	116,364 30	30,620 97	146,985 27	58,794 11
33,756 33	9,047 53	2,703 77	202,248 13	3,907 34	107,175 15	37,860 13	145,035 28	58,014 11
83,963 29	37,397 99	2,703 77	202,248 13	8,963 34	553,089 22	92,272 86	645,362 08	258,144 83
16,708 20	3,008 45	10,118 00	2,208 24	2,208 24	37,185 89	44,589 13	81,775 02	32,710 01
11,944 11	22,706 92	10,118 00	4,375 03	4,375 03	73,338 65	80,125 08	153,463 73	61,385 49
7,051 35	10,465 00	22,727 59	3,737 64	3,737 64	253,122 29	113,244 83	366,367 12	146,546 85
18,069 47	836 45	8,174 60	1,831 62	1,831 62	31,464 94	24,564 38	56,029 32	22,411 73
1,073 00	4,059 45	5,500 00	5,061 51	5,061 51	117,502 56	88,552 54	206,055 10	82,422 04
20,178 02	5,166 80	1,115 60	2,775 76	2,775 76	137,643 38	29,068 86	166,712 24	66,684 90
2,605 99	25,689 06	16,842 25	2,045 56	2,045 56	84,652 99	11,574 00	96,226 99	38,490 80
4,760 10	4,041 98	11,206 06	4,371 86	4,371 86	70,423 97	61,453 00	131,876 97	52,750 79
14,043 17	26,807 15	8,044 77	4,441 81	4,441 81	44,677 52	81,428 69	126,106 21	50,442 48
5,718 15	35,843 89	4,152 95	4,714 94	4,714 94	132,634 52	50,481 86	183,116 38	73,246 56
1,703 65	8,689 59	12,242 34	4,078 05	4,078 05	68,764 51	62,207 85	143,010 72	57,204 29
14,146 65	29,829 56	4,152 95	3,098 84	3,098 84	202,838 70	34,129 25	264,603 07	105,841 23
16,571 40	3,850 52	7,300 00	3,125 23	3,125 23	29,122 46	28,054 92	57,177 38	22,870 95
97,052 24	11,373 63	7,300 00	2,274 84	2,274 84	384,688 47	53,834 39	438,522 86	175,409 15
10,209 47	28,200 89	14,004 64	8,884 78	8,884 78	54,768 14	103,590 19	192,066 38	76,826 55
6,880 55	29,686 43	4,831 35	4,939 96	4,939 96	88,476 19	131,806 78	349,839 67	139,935 90
7,505 80	1,087 72	8,465 23	3,622 48	3,622 48	218,032 89	33,335 51	88,103 65	35,241 46
12,100 62	3,019 72	8,465 23	2,827 98	2,827 98	54,768 14	49,758 48	90,367 22	36,146 89
7,261 50	14,095 50	8,465 23	4,697 15	4,697 15	40,608 74	33,335 51	88,103 65	35,241 46
7,107 25	3,809 28	8,465 23	2,480 86	2,480 86	106,792 87	66,558 62	173,351 49	69,340 59
48,547 56	14,095 50	8,465 23	2,586 25	2,586 25	102,545 47	29,039 65	131,585 12	52,634 05
21,443 07	2,180 32	8,465 23	1,518 05	1,518 05	15,227 61	60,426 06	75,653 67	30,261 47
16,190 84	10,304 38	3,924 42	2,520 00	2,520 00	23,491 82	24,331 21	47,823 03	19,129 21
3,306 08	6,740 56	5,732 69	3,649 60	3,649 60	521,406 95	10,988 27	532,395 22	212,958 09
8,698 99	13,884 49	6,000 00	2,187 22	2,187 22	35,325 55	36,086 68	71,412 23	28,564 89
39,897 38	2,875 70	30,930 29	6,159 17	6,159 17	235,241 12	28,990 56	264,231 68	105,692 67
4,136 44	14,935 99	10,000 00	3,574 64	3,574 64	72,183 95	134,925 51	207,109 46	82,843 79
34,141 16	16,371 30	6,579 83	5,712 69	5,712 69	394,416 67	67,469 07	461,885 74	184,754 30
581,126 79	3,830 59	6,579 83	4,292 54	4,292 54	54,686 23	21,418 98	76,105 21	30,442 08
	7,573 08	30,897 52	2,961 79	2,961 79	85,896 35	43,059 82	128,956 17	51,582 47
	5,610 71	2,631 22	3,899 77	3,899 77	247,603 17	64,700 78	312,303 95	124,921 58
	19,843 56	557 17	3,378 69	3,378 69	61,233 51	97,062 36	158,295 87	63,318 35
			5,382 01	5,382 01	48,399 35	175,811 92	224,211 27	89,684 51
			4,589 08	4,589 08	497,506 96	40,926 98	538,433 94	215,373 58
581,126 79	510,489 47	234,682 29	225,248 13	146,217 35	5,429,335 93	2,206,114 54	7,635,450 47	3,054,180 25

APPENDIX

SUMMARY,

Schedule of Expenditure on Maintenance

For the period beginning January 1st, 1921,

County	Grading	Culverts	Resurfacing	Dragging	Oiling or Tarring
	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
Brant.....	1,305 00	125 45	24,176 39	3,185 32	363 22
Bruce.....	8,421 13	1,280 27	26,016 79	1,317 32	.....
Carleton.....	4,120 56	1,517 29	66,260 98	1,375 34	13,821 48
Dufferin.....	7,180 17	789 90	33,555 50	1,908 83	Guard rail 102 25
Elgin.....	5,280 54	854 05	60,225 89	7,534 01	.....
Essex.....	726 87	294 82	93,562 91	17,526 98	461 98
Frontenac.....	4,478 97	848 36	17,528 19	.....	939 25
Grey.....	2,388 94	2,851 09	80,140 74	1,275 65	.....
Haldimand.....	1,076 79	301 75	23,355 00	3,690 00	.....
Halton.....	.....	401 04	9,496 74	1,154 42	.....
Hastings.....	11,676 03	2,885 83	39,151 60	1,395 27	.....
Huron.....	6,813 29	2,620 45	62,830 70	3,392 19	2,826 88
Kent.....	5,846 20	599 11	26,240 74	11,304 24	.....
Lambton.....	7,020 68	1,764 17	45,659 94	6,142 20	.....
Lanark.....	6,383 52	441 80	26,233 28	535 65	.....
Leeds and Grenville.....	1,723 72	2,455 30	56,412 17	540 85	.....
Lennox and Addington.....	470 25	328 68	26,535 69	90 25	.....
Lincoln.....	487 34	662 30	34,044 74	5,430 57	9,655 32
Middlesex.....	3,203 09	1,452 27	78,260 21	12,373 12	2,920 83
Norfolk.....	24,046 88	1,615 09	100,657 33	1,862 78	.....
Northumberland and Durham	4,145 47	3,746 25	20,281 90	2,089 20	.....
Ontario.....	7,303 92	1,076 22	36,000 57	3,001 41	3 50
Oxford.....	1,821 55	3,903 05	56,428 88	885 65	.....
Peel.....	1,273 03	491 54	24,802 56	1,325 55	229 50
Perth.....	4,763 30	47 87	50,579 77	3 80	3,272 13
Peterboro.....	6,353 51	936 93	15,885 55	.....	.....
Prescott and Russell.....	3,131 58	262 50	3,789 96	1,713 25	.....
Prince Edward.....	2,290 90	1,243 73	31,272 02	.....	1,280 03
Renfrew.....	2,128 52	2,009 85	19,346 82	1,713 77	3,036 71
Simcoe.....	8,869 40	995 38	121,703 40	1,625 20	310 23
Stormont, Dundas and Glen- garry.....	7,688 74	3,132 29	42,865 20	2,433 42	8,672 60
Victoria.....	704 97	863 26	14,946 72	2,720 16	561 48
Waterloo.....	1,106 40	100 95	38,090 98	3,266 19	.....
Welland.....	3,700 15	169 43	58,793 26	960 35	575 40
Wellington.....	8,139 43	4,436 27	76,515 48	5,033 58	200 25
Wentworth.....	12,328 13	8,672 03	145,515 09	2,704 71	5,835 75
York.....	4,014 66	854 64	14,705 62	930 10	18,045 21
Totals.....	182,413 63	57,031 21	1,701,869 31	112,441 33	73,114 00

No. 2

1921

and Repair on County Roads

and ending December 31st, 1921

Snow Shovelling	Bridges	Ditching and Draining	Cutting Weeds and Brush	Wire Fence Bonus	Total Expenditure	Total Government Grant, 40%
\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
32 00	996 49	Guard rails	413 30		30,620 97	12,248 39
83 47	741 15	23 80			37,860 13	15,144 05
2,099 79	1,694 14	507 25	876 03		92,272 86	36,909 14
49 35	759 73	156 80	86 60		44,589 13	17,835 65
28 85	5,177 56	90 63	933 55		80,125 08	32,050 03
	470 68	200 59			113,244 83	45,297 93
65 25	229 40		114 45	360 51	24,564 38	9,825 75
777 60	379 74			738 78	88,552 54	35,421 02
	266 17		379 15		29,068 86	11,627 54
114 71	407 09				11,574 00	4,629 60
1,436 24	4,598 86		309 17		61,453 00	24,581 20
152 22	2,773 91		19 05		81,428 69	32,571 48
	4,713 38	644 52	999 77	133 90	50,481 86	20,192 74
62 99	558 80	505 24	493 83		62,207 85	24,883 14
	535 00				34,129 25	13,651 70
	300 38	37 50		294 45	61,764 37	24,705 75
273 22	356 83				28,054 92	11,221 97
16 75	302 75	2,163 94	1,070 68		53,834 39	21,533 76
23 00	2,643 00	1,127 81	1,586 86		104,590 19	41,436 08
		Guard rail				
1,548 55	1,155 86	660 32	259 97		131,806 78	52,722 71
1,294 05	1,778 64				33,335 51	13,334 20
95 72	294 97		1,440 68	541 49	49,758 48	19,903 39
Snow fence						
1,268 95						
5 50	1,133 98	594 56	398 90	117 60	66,558 62	26,623 45
	858 82	58 65			29,039 65	11,615 86
266 02	1,493 17				60,426 06	24,170 42
91 78	1,042 44		21 00		24,331 21	9,732 48
1,496 61	131 60		462 77		10,988 27	4,395 31
					36,086 68	14,434 67
15 90	413 63		325 36		28,990 56	11,596 22
21 20	583 80			816 90	134,925 51	53,970 20
710 00	1,241 82		725 00		67,469 07	26,987 63
31 85	107 74	462 40	306 85	713 55	21,418 98	8,567 59
	495 30				43,059 82	17,223 93
20 40	134 09		347 70		64,700 78	25,880 31
47 85	1,914 92			774 58	97,062 36	38,824 94
273 87	482 34				175,811 92	70,324 77
472 10	1,904 65				40,926 98	16,370 79
12,875 79	43,072 83	7,234 01	11,570 67	4,491 76	2,206,114 54	882,445 79

APPENDIX

SUMMARY,

Statement of Work and Expenditure on

County	Work Done During Year						
	Miles Graded	Miles Surfaced		Tile Drain Rods	Bridges	Pipe and Tile Culverts	Other Culverts
		Other Surfaces	Gravel				
Brant.....	3.37	0.87 Con. 1.52		1,194	1	20	6
Bruce.....	0.25	2.50	3.75	21	6	55	7
Carleton.....	3.00	13.20		682	3	36	32
Dufferin.....			.06		1	12	
Elgin.....	0.31		2.5	642		3	
Essex.....		Bit.Mac. 1.99 Con. 2.32		327	1		4
Frontenac.....							1
Grey.....	1.41	9.66	9.00		6		54
Haldimand.....	2.00					8	
Halton.....	0.21	2.25 Con. 4.04	3.00	15	3	4	
Hastings.....	2.50	3.00	3.50			15	1
Huron.....			1.25		1		1
Kent.....	2.73	Con. 9.28		2,766	1	22	3
Lambton.....				432	2	14	5
Lanark.....		2.25		60		15	2
Leeds and Grenville.....		3.00				10	4
Lennox and Addington.....		3.69				3	
Lincoln.....							
Middlesex.....	4.25			43	1	2	1
Norfolk.....		Bit.Mac 3.58		60		7	
Northumberland and Durham.....			3.50		1	13	
Ontario.....	8.30			59	4	28	4
Oxford.....							
Peel.....							
Perth.....	0.92		1.25	413			
Peterboro.....							
Prescott and Russell.....		Bit.Mac. 5.50				11	4
Prince Edward.....							
Renfrew.....	5.25	7.34			1	44	11
Simcoe.....	1.00	3.10	4.00		6	30	3
Stormont, Dundas and Glengarry.....		27.00			3	22	14
Victoria.....		2.73		80	1	23	12
Waterloo.....		Con. 3.37 Bit.Mac. 5.92	0.12			2	2
Welland.....		6.78				6	2
Wellington.....				4			3
Wentworth.....							2
York.....	0.50	3.78 Asp.Con.2.02	4.00	48		73	6
	36.00	*130.69	35.93	6,846	42	478	184

* Includes—

W.B. Macadam..... 91.14 miles.
Concrete..... 20.53 do.
Bituminous Macadam... 17.00 do.
Asphaltic Concrete..... 2.02 do.

No. 3

1921

Provincial-County Road Construction

Approved Expenditure During Year

Roads and Culverts	Bridges	Special Grants to Towns and Villages	Total Approved Expenditure on Construction	Total Approved Expenditure on Maintenance	Total Approved Expenditure	Government Grant 60%
\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
92,686 31	2,884 33		95,570 64	51,998 29	147,568 93	88,541 36
44,626 26	24,586 34	3,146 62	72,359 22	24,061 10	96,420 32	57,852 19
336,454 25	17,879 42		354,333 69	10,407 63	364,741 30	218,844 78
4,229 43	2,527 46		6,756 89	6,805 22	13,562 11	8,137 27
5,838 46		1,987 00	7,825 46	19,414 21	27,239 67	16,343 80
107,427 15	1,225 50	3,250 00	111,902 65	15,305 41	127,208 06	76,324 84
346 73			346 73	10,715 58	11,062 31	6,637 39
206,795 90	8,371 59	9,250 00	224,417 49	4,301 64	228,719 13	137,231 48
1,415 52			1,415 52	485 62	1,901 14	1,140 68
125,556 30	5,191 42		130,747 72	7,369 15	138,116 87	82,870 12
19,150 22			19,150 22	52,351 41	71,501 63	42,900 98
3,658 36	5,223 54	2,336 68	11,218 58	39,738 35	50,956 93	30,574 16
318,583 19	20,126 23	19,125 69	357,835 11	26,978 99	384,814 10	230,888 46
7,684 15	16,590 15	1,328 17	25,602 47	29,751 28	55,353 75	33,212 25
39,231 44			39,231 44	4,129 90	43,361 34	26,016 80
22,181 19			22,181 19	13,816 38	35,997 57	21,598 54
12,581 60			12,581 60	21,909 64	34,491 24	20,694 74
3,671 98	4,411 87		8,083 85	18,448 78	26,532 63	15,919 58
77,478 58			77,478 58	8,481 95	85,960 53	51,576 31
15,210 10	1,339 16		16,549 26	16,137 60	32,686 86	19,612 12
8,454 17	9,816 50	2,322 05	20,592 72	20,411 51	41,004 23	24,602 54
16 50		9,545 33	9,561 83	23,974 61	33,536 44	20,121 86
3,463 09			3,463 09	4,321 56	7,784 65	4,670 79
123,630 84			123,630 84	4,327 89	4,327 89	2,596 73
171,516 80	4,860 65	5,000 00	181,377 45	12,894 34	12,894 34	7,736 60
50,539 12	12,772 57	16,588 16	79,899 85	4,998 49	186,375 94	111,825 56
354,742 36	10,159 29		364,901 65	40,429 50	405,331 15	243,198 69
58,922 85	1,958 71	5,915 09	66,796 65	10,459 89	77,256 54	46,353 92
85,991 67			85,991 67	5,599 91	91,591 58	54,954 95
135,871 18		3,567 47	139,438 65	24,018 33	163,456 98	98,074 19
2,145 70			2,145 70	32,040 73	34,186 43	20,511 86
926 78			926 78	27,804 87	28,731 65	17,238 99
91,214 87	18,226 17		109,441 04	19,606 46	129,047 50	77,428 50
2,532,243 05	168,150 90	83,362 26	2,783,756 21	659,081 71	3,442,837 92	2,065,702 74

APPENDIX

SUMMARY,

Schedule of Expenditure on Maintenance

For the period beginning Jan. 1st, 1921,

County	Grading	Culverts	Resurfacing	Dragging	Oiling or Tarring
	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
Brant.....	721 51	59 63	37,666 77	2,511 99	3,483 92
Bruce.....	5,226 23	705 51	16,252 10	1,497 64	.....
Carleton.....	915 09	11 00	1,710 65	280 00	5,437 07
					Guard rail
Dufferin.....	630 30	115 12	5,398 00	287 60	38 30
Elgin.....	783 50	118 25	16,178 43	1,976 08	.....
Essex.....	526 45	293 23	6,862 06	7,137 32	.....
Frontenac.....	3,227 72	385 98	6,858 70	.....	.....
Grey.....	667 05	197 89	2,932 45	261 15	130 55
Haldimand.....	36 00	2 82	.....	430 30	.....
Halton.....	.....	86 75	6,682 70	587 70	.....
Hastings.....	19,482 08	1,332 02	30,258 47	552 68	680 66
Huron.....	2,742 68	1,277 70	29,658 39	1,369 96	24 34
Kent.....	794 90	320 94	20,303 33	4,545 05	.....
Lambton.....	5,209 17	208 77	19,851 28	2,728 44	47 95
Lanark.....	1,500 00	.....	2,429 90	200 00	.....
Leeds and Grenville.....	.....	.....	13,816 38	.....	.....
Lennox and Addington.....	544 50	93 28	20,310 33	22 60	.....
Lincoln.....	.....	.....	.....	.....	.....
Middlesex.....	899 28	72 45	14,608 26	1,733 56	179 87
Norfolk.....	1,202 87	93 27	6,237 71	291 55	420 00
Northumberland and Durham	1,700 00	635 13	11,082 47	1,000 00	.....
Ontario.....	2,091 15	465 69	14,617 14	2,005 94	9 00
Oxford.....	411 53	191 49	23,166 35	50 50	.....
Peel.....	.....	.....	.....	.....	.....
Perth.....	1,326 65	26 25	2,780 51	.....	.....
Peterboro.....	697 88	59 70	3,570 31	.....	.....
Prescott and Russell.....	.....	.....	.....	.....	.....
Prince Edward.....	1,413 60	399 20	10,769 12	.....	312 42
Renfrew.....	226 10	71 65	1,275 83	691 50	2,330 91
Simcoe.....	2,991 77	45 00	40,601 68	1,316 00	.....
Stormont, Dundas and Glen-	.....	.....	.....	.....	.....
garry.....	1,808 54	649 28	19,071 54	380 45	17,059 64
Victoria.....	133 25	252 13	7,351 30	1,313 29	213 75
Waterloo.....	476 20	.....	4,317 38	62 62	.....
Welland.....	336 60	41 88	22,249 19	320 85	1,009 31
Wellington.....	5,651 03	991 57	22,524 73	1,523 96	1,194 72
Wentworth.....	2,209 79	2,155 99	21,694 40	484 00	1,260 69
York.....	1,703 49	89 30	9,238 06	382 80	8,079 21
Totals.....	68,286 91	11,448 87	472,325 92	35,945 53	41,912 31

No. 4

1921

and Repair on Provincial County Roads

and ending December 31st, 1921.

Snow Shovelling	Bridges	Ditching and Draining	Cutting Weeds and Brush	Wire Fence Bonus	Total Expenditure	Total Government Grant, 60%
\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
59 00	7,149 45	.....	346 02	.....	51,998 29	31,198 97
110 10	269 52	.....	.....	.....	24,061 10	14,436 66
734 96	59 91	1,250 00	8 95	.....	10,407 63	6,244 58
9 90	41 00	94 45	190 55	.....	6,805 22	4,083 13
.....	.....	84 30	273 65	.....	19,414 21	11,648 53
.....	486 35	.....	.....	.....	15,305 41	9,183 25
3 50	175 58	.....	.....	64 10	10,715 58	6,429 35
39 35	.....	73 20	.....	.....	4,301 64	2,580 98
.....	.....	.....	16 50	.....	485 62	291 37
.....	12 00	.....	.....	.....	7,369 15	4,421 49
22 50	23 00	.....	.....	.....	52,351 41	31,410 85
19 40	4,627 88	.....	18 00	.....	39,738 35	23,843 01
.....	165 41	403 61	445 75	.....	26,978 99	16,187 39
.....	869 82	7 46	Oper'g Ferry 828 39	.....	29,751 28	17,850 77
.....	.....	.....	.....	.....	4,129 90	2,477 94
.....	.....	.....	.....	.....	13,816 38	8,289 83
5 95	932 98	.....	.....	.....	21,909 64	13,145 78
36 15	73 05	465 88	380 28	.....	18,448 78	11,069 27
89 20	4 80	Guard rails 2 00	140 55	.....	8,481 95	5,089 17
940 00	530 00	.....	250 00	.....	16,137 60	9,682 56
17 70	187 66	.....	467 33	549 90	20,411 51	12,246 91
.....	3 00	31 52	120 22	.....	23,974 61	14,384 77
13 00	175 15	.....	.....	.....	4,321 56	2,592 94
.....	.....	.....	.....	.....	4,327 89	2,596 73
.....	.....	.....	.....	.....	12,894 34	7,736 60
.....	12 50	.....	390 00	.....	4,998 49	2,999 09
28 00	398 99	.....	.....	204 05	45,585 49	27,351 29
717 00	437 30	.....	305 75	.....	40,429 50	24,257 70
13 75	12 30	668 96	219 16	282 00	10,459 89	6,275 93
.....	743 71	.....	.....	.....	5,599 91	3,359 95
.....	.....	.....	60 50	.....	24,018 33	14,411 00
2 10	.....	.....	.....	152 62	32,040 73	19,224 44
.....	.....	.....	.....	.....	27,804 87	16,682 92
113 60	.....	.....	.....	.....	19,606 46	11,763 88
2,975 16	17,391 36	3,081 38	4,461 60	1,252 67	659,081 71	395,449 03

APPENDIX No. 5

SUMMARY, 1921

Expenditure on Township Roads

The following schedule shows in detail the work and approved expenditure on Township Roads during 1921, and upon which Provincial subsidies were paid in 1922, under the provisions of the Ontario Highways Act.

Number of Townships	Approved Expenditure for Year						Superintendence		Total Approved Expenditure	Total Government Grant
	Roads and Culverts	Bridges	Maintenance	Machinery	Purchase of Gravel Pits	Approved Expenditure	Government Grant 20%	Expenditure	Government Grant 40%	
294	\$844,829 42	\$501,650 14	\$1,888,048 75	\$142,316 18	\$12,420 81	\$3,389,265 30	\$677,852 96	\$76,585 03	\$30,634 01	\$708,486 91

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LIST OF PUBLICATIONS ISSUED BY THE DEPARTMENT OF PUBLIC HIGHWAYS.

Pub. No.	Title.
	Annual Reports.
	Annual Proceedings, Ontario Good Roads Association.
9.	Report of the Ontario Highways Commission, 1914.
10.	Regulations respecting Township Road Superintendents, 1916.
11.	Regulations respecting County Roads, 1920.
14.	Township Road Improvement, 1918.
15.	The Motor Vehicles Act, The Highway Travel Act, The Load of Vehicles Act, The Public Vehicles Act, 1920.
16.	General Specifications for Concrete Highway Bridge, 1920.
17.	General Specifications for Steel Highway Bridges, 1917.
18.	Highway Bridges, 1917.
19.	General Plans for Steel Highway Bridges, 1917.
20.	Description of Road Models Exhibit, 1917.
21.	Short Forms for Bridge Tenders, 1917.
22.	Report on Street Improvement, 1917.
23.	Bituminous Surfaces for Macadam Roads, 1917.
24.	Specifications for Bituminous Materials, 1917.
25.	County Road Legislation, as enacted by The Highway Improvement Act, The Ontario Highways Act, and The Obstructions on Highways Removal Act, 1920.
27.	Widening the Provincial Highway, 1919.
28.	Main Road Legislation, 1919.
29.	Regulations respecting Township Roads, 1920.
30.	Township Road Legislation, as enacted by The Ontario Highways Act, 1920.
31.	Motor Vehicle Headlamps.
32.	Report of Committee on Road Accounting.
33.	The Provincial Highway Act, 1922.
34.	The Planting and Care of Roadside Trees, 1923.

JUL 1922
UNIVERSITY OF TORONTO

ANNUAL REPORT

OF THE

Department of Public Highways

ONTARIO

1922

PRINTED BY ORDER OF
THE LEGISLATIVE ASSEMBLY OF ONTARIO



TORONTO

Printed and Published by Clarkson W. James, Printer to the King's Most Excellent Majesty
1923

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TO HIS HONOUR HENRY COCKSHUTT,
Lieutenant-Governor of the Province of Ontario.

MAY IT PLEASE YOUR HONOUR:

I herewith beg to present for your consideration the Annual Report of the Department of Public Highways, relating to Highway Improvement in the Province of Ontario during the year 1922.

Respectfully submitted,

F. C. BIGGS,
Minister of Public Works and Highways.

TO THE HONOURABLE F. C. BIGGS,
Minister of Public Works and Highways.
Ontario.

SIR,—I have the honour to submit the Annual Report of the Department of Public Highways for the year 1922, having special reference to work on the Provincial Highway System under the Provincial Highways Act; work carried on by the several counties of Ontario under the Highway Improvement Act; and by township councils whose work is now subsidized under the Ontario Highways Act, 1920.

Reference is also made to the operation of the Motor Vehicles Act; and to other services within the purview of the Department of Public Highways.

I have the honour to be, Sir,

Yours respectfully,

W. A. McLEAN,
Deputy Minister of Highways.

Parliament Buildings, Toronto, May 28th, 1923.



DUNDAS STREET PROVINCIAL HIGHWAY

High level bridge over Sixteen Mile Creek. Length of bridge 936 feet; height of floor above bed of stream 126 feet.

Highway Improvement in Ontario

Report by W. A. McLEAN, Deputy Minister.

ROAD CONSTRUCTION in Ontario during the past year has been systematically continued, and at the close of the season a large addition to the mileage of improved roads of all classes had been completed. The activities of the Department of Public Highways were many and diversified. Not only was a substantial programme of construction on the Provincial Highways undertaken and completed, but the work of counties and townships on the roads controlled by these local municipalities was marked by improvement in the quality of the work, more thorough organization, and closer co-operation with the Department.

This was more particularly the case with the townships, the greater number of which are receiving Provincial assistance under the Ontario Highways Act. Although this aid to the townships has been available for only three years, the reports of the Department Engineers, who inspect the work and consult with the townships officials, indicate that the townships, for the most part, are making an earnest endeavour to place their road improvement on a businesslike basis; are gradually discarding statute labour on their roads, and substituting therefor a controlled system of expenditure under qualified road overseers.

Probably the most noticeable feature in county road work has been the construction of a substantial mileage of the more permanent types of surface, such as bituminous macadam, asphaltic concrete and cement concrete. In many counties there are certain roads on which traffic has materially increased in volume. As a result maintenance costs on gravel and waterbound macadam roads have reached a point where economy necessitates the use of surfaces which entail a greater initial expenditure, but which, on account of the better service rendered, will prove more economical in the end.

The mileage of roads with respect to classification in that part of Ontario under county organization is now as follows:—

Provincial Highways (ordinary).....	1,465 miles.
Provincial Suburban	358 "
Total Provincial Highways.....	1,823 "
County Roads (ordinary)	7,536 miles.
County Provincial Roads.....	1,905 "
County Suburban Roads.....	401 "
County Provincial Suburban Roads.....	150 "
Total County Roads.....	9,812 "
Township Roads.....	38,240 miles
Total Mileage of Roads in Southern Ontario..	49,875 "

On County and Provincial County Roads, in addition to the grading of approximately 790 miles, a substantial amount of surfacing was completed during the year. A careful survey of road conditions was made by officers of the

Department at the end of December, 1921, and again at the end of the year 1922, and some measure of progress for the latter year is shown by the following comparative statement:

Year	Gravel	Water-bound macadam	Oiled or tarred macadam	Bituminous macadam	Asphaltic concrete	Cement concrete	Brick	Total
1922.....	5,956.53	2,174.07	220.0	128.22	21.73	100.12	0.5	8,601.17
1921.....	5,665.00	1,878.00	182.0	94.00	13.50	65.00	0.5	7,898.00
Increase..	291.53	296.07	38.0	34.22	8.23	35.12	0.0	703.17



TORONTO-PORT HOPE PROVINCIAL HIGHWAY

New high level bridge over Highland Creek. Length of bridge 655 feet; height of floor above bed of stream 100 feet; thirty-foot roadway with two six-foot sidewalks.

PROVINCIAL HIGHWAYS

Since the inauguration of the Provincial Highway System in 1917, and its subsequent expansion, grading and the construction of culverts and bridges, which must of necessity precede surfacing, have largely occupied the attention of the Department. At the same time where paving and surfacing could be done, and where traffic conditions warranted, a considerable amount of this work was accomplished. The beginning of the year 1922 witnessed the completion of the structures and preliminary grading on a large mileage of the system and this enabled more surfacing than in previous years to be done.

On the sections of the Highways that were not actually under construction systematic methods of maintenance were continued. Gravel surfaces received light applications of new gravel and were constantly dragged. Macadam surfaces were patrolled by patrolmen and a large amount of road oil and refined tar was used to treat them; ditches, culverts and watercourses were kept open and weeds were cut as available labour and equipment would permit.

A more detailed description of the season's work will be found on following pages of this report. Mention might, however, be made of a few of the larger undertakings that were completed.

On the Kingston-Brockville road a considerable amount of heavy grading was necessary in the vicinity of Yonge's Mills and Mallorytown and the construction of four miles of oiled macadam connected Kingston with Gananoque, with the exception of a short piece, one-half mile long. West of Odessa two miles were surfaced with waterbound macadam.

A macadam base was constructed easterly from Morrisburg for $4\frac{1}{2}$ miles, and in Charlottenburg Township, east of Cornwall, for four and a half miles.

On the Kingston-Ottawa road a two-course macadam surface with tar treatment was built from Barriefield northerly for four miles. Macadam base was laid between Ottawa and Stittsville, a distance of eight miles; from Carleton Place westerly for four and a half miles, and southerly from Perth for three miles.

Five and a half miles of macadam surface were laid on the Ottawa-Pembroke road, easterly from Ottawa, and one-half mile of asphaltic concrete on the Provincial Highway in the town of Pembroke.

Southerly from Ottawa, on the Prescott Highway, four miles of asphaltic concrete surface were laid. Three miles of base course were constructed on the Point Fortune road between Green's Creek and Orleans, and one mile of bituminous macadam was constructed in Rockland village.

Between Belleville and Picton, a total of four and a half miles of macadam



TORONTO-PORT HOPE PROVINCIAL HIGHWAY
Showing improved alignment and asphaltic concrete pavement.

base were laid and on the Belleville-Foxboro road, three miles of two-course macadam were completed.

On the Peterboro-Port Hope road south of Peterboro five miles of macadam base were laid.

On the Toronto-Port Hope road three miles of concrete pavement were laid in Scarboro township, and from the Rouge River easterly to Dunbarton two and a half miles of asphaltic concrete were completed. The latter work, connecting with the pavement previously laid between Pickering village and Dunbarton, gives a continuous pavement between the Rouge and Pickering, a distance of about five miles.

Probably the most outstanding piece of work on this road was the completion of the new bridge over Highland Creek Ravine about 10 miles east of the city, a steel structure carrying the roadway at a height of one hundred feet above the creek. Two steep hills, on one of which was a sharp turn on a nine per cent. grade, were eliminated. While the distance across the ravine on the old

road was thirty-five hundred feet, the new bridge is only 650 feet long and the approaches about two hundred and fifty feet.

On Yonge Street an asphaltic concrete surface was built from the northern limits of the city of Toronto to Thornhill, a distance of $5\frac{3}{4}$ miles. A new location at Holland Landing resulted in the doing away with several dangerous curves on a steep grade and the elimination of two level railway crossings over the Canadian National Railway. The level crossing south of the town of Aurora was replaced by a subway under the Canadian National Railway.

Between Barrie and Orillia the road was, for the most part, graded and gravelled, and north of Orillia a macadam surface was constructed for a distance of two miles.

On Dundas Street between Toronto and Hamilton, thirteen miles of macadam base were constructed. The bridges, grading and preliminary surfacing on the new entrance into Hamilton off Dundas Street, the Guelph Road and the Toronto and Hamilton Highway were completed and the entrance was formally opened to traffic on August 23rd.



HAMILTON-LONDON PROVINCIAL HIGHWAY
Cement concrete pavement between London and Crumlin.

South from Owen Sound a macadam base was laid over a length of two and a half miles, and north from Guelph to the junction with the Elora Road a concrete pavement was built, a distance of three miles.

Between Brantford and Hamilton the pavement was completed by the construction of about six miles of asphaltic concrete in Ancaster township. This connects with the concrete pavement extending easterly from the city of Brantford. A pleasing feature in connection with the formal opening of this road, on November 15th, was the presence of the Honourable J. L. Perron, Minister of Highways of the Province of Quebec.

A subway was constructed on this road under the Toronto, Hamilton and Buffalo Railway at Binkley's Corners.

The concrete pavement from the city of Hamilton easterly for four miles on the Hamilton-Queenston road was completed.

The cities of Welland and Niagara Falls were joined by a macadam surface. Easterly from Chatham concrete was laid for a distance of three and three-quarter miles, which with the surface previously laid gives a continuous pavement for five and three-quarter miles. West from Chatham two and three-quarter miles of concrete were laid.

The completion of three and three-quarter miles of concrete pavement southerly from Windsor on the old Talbot Road completes the ten miles between Windsor and Maidstone.

Easterly from London two and a quarter miles of concrete pavement were laid to Crumlin. The London-St. Thomas road was surfaced with concrete from Lambeth, which was the southern extremity of the pavement laid in 1921, to Sandy Mount, a mile north of St. Thomas. The mile between St. Thomas and Sandy Mount involved some heavy grading which was required before pavement could be laid.

The macadam surface between Cayuga and Jarvis, a distance of 15 miles, was completed. This gives an improved surface from Jarvis to Dunnville, a distance of 31 miles.

In addition to the work described above a large mileage of the Provincial Highway System was graded and gravelled and all but about four hundred culverts were completed by the end of the year.

A number of bridges were erected where the existing structures were not sufficiently strong to carry traffic. Of these the bridge over the the north branch of the Thames River at London and that over the Credit River at Erindale on Dundas Street might be mentioned. In all 24 such structures were completed.

COUNTY ROADS

The Highway Improvement Act was initiated in 1901, when an appropriation of \$1,000,000. was made by the Provincial Government with a view to aiding the construction of county roads; the Provincial subsidy being $33\frac{1}{3}$ per cent. The first counties to pass the necessary by-laws adopting a system of county roads were Simcoe and Wentworth, which were approved by the Lieutenant-Governor in Council in June and November, 1902, respectively.

By a process of evolution, this Act, which provides for the establishing of a County Road System, has been placed on a permanent and satisfactory basis. Counties now receive from the Province 40 per cent. of the expenditure on county roads and 60 per cent. of the expenditure on Provincial county roads.

Since the passing of the Highway Improvement Act and to the end of 1922, a total of \$45,220,294.61 has been expended on construction and maintenance of county roads, of which the Province has contributed \$19,500,162.24. This includes the county expenditure of 1922, on which the Provincial subsidy was paid in 1923.

Of the 49,875 miles of road in the area covered by the County Road System at the end of 1922, approximately 27,911 miles or 56 per cent. have been surfaced with gravel, broken stone or other more permanent material.

The length of the county road systems within the thirty-seven counties at the end of 1922 amounted to approximately 20 per cent. of the total road mileage in the area covered by the County Road System.

The following table shows the mileage of the various types of road laid on the County Road System at the end of 1922:—

Gravel.....	5,956.53	miles
Waterbound macadam.....	2,174.07	"
Cement concrete.....	100.12	"
Bituminous macadam (penetration).....	128.22	"
Asphaltic concrete.....	21.73	"
Oiled or tarred macadam.....	220.00	"
Brick.....	0.50	"
Total.....	8,601.17	"

This is approximately 87 per cent. of the mileage of County Road System. This creditable record is largely due to the use of gravel in counties where gravel is plentiful and easily obtained. In the counties of Huron, Waterloo and Oxford the entire mileage of the County Road System has been surfaced with gravel or other material.

In addition to the construction of road surfaces, numerous bridges and concrete box culverts are being built annually, and approximately 1,200 miles of road resurfaced with gravel or crushed stone and widened to meet the traffic requirements of to-day.

Work on the County Road System has shown remarkable development during recent years, all of which accrue to the good of the Province and bring fresh interest to life and its activities for those whom the roads serve.



STRATFORD-GODERICH PROVINCIAL HIGHWAY
Asphaltic concrete pavement between Stratford and Sebringville.

Expenditure on the County Road System in 1922 was as follows:—

Construction	Total Expenditure	Provincial Grant
Provincial County Roads.....	\$2,420,559.40	\$1,452,335.62
County Roads.....	4,475,706.65	1,787,562.58
Total Construction.....	\$6,896,266.05	\$3,239,898.20
Maintenance		
Provincial County Roads.....	\$559,756.82	\$335,854.09
County Roads.....	1,696,740.41	678,696.14
Total Maintenance.....	\$2,256,497.23	\$1,014,550.23
Summary		
Total Construction.....	\$6,896,266.05	\$3,239,898.20
Total Maintenance.....	2,256,497.23	1,014,550.23
Total Expenditure.....	\$9,152,763.28	\$4,254,448.43

The work on which the foregoing expenditures for construction were made included the following:—

Grading.....	789.99 miles
Gravel.....	291.53 miles
Waterbound macadam.....	296.07 "
Cement concrete.....	35.12 "
Bituminous macadam (penetration).....	34.22 "
Asphaltic concrete.....	8.23 "
Oiled or tarred macadam.....	38.00 "
Total surfaced.....	703.17 miles

Bridges over 10-feet span.....	126
Concrete slab culverts.....	571
Pipe and tile culverts.....	2,674

Among the special features of road improvement effected during the year the following works may be mentioned:—

COUNTY ROAD MILEAGE AND EXPENDITURE

From inception of County Road Systems up to December 31st, 1922.
The Provincial Subsidies on 1922 expenditure to be paid in 1923.

COUNTY	Year of Estab- lish't of System	Road Mileage				Total Approved Expenditure to end of 1922	Total Government Grant
		Count- ty Roads	Coun- ty Sub- urban Roads	Pro. Co. Roads	Pro. Co. Sub. Roads		
Brant.....	1917	49.5	2.0	33.5	17.0	\$838,023.61	\$406,013.57
Bruce.....	1917	192.4	.....	132.0	.....	796,158.71	389,170.37
Carleton.....	1909	225.5	20.0	41.5	10.0	2,901,020.34	1,299,209.03
Dufferin.....	1918	150.1	.....	48.6	.....	427,518.62	183,779.22
Elgin.....	1917	248.2	16.3	34.8	4.0	834,507.99	366,459.76
Essex.....	1916	179.3	33.0	53.5	11.0	1,654,895.52	770,344.65
Frontenac.....	1907	122.0	30.5	42.5	10.5	583,332.10	228,625.75
Grey.....	1918	293.9	29.6	58.4	14.4	1,248,758.79	624,637.01
Haldimand.....	1911	130.0	.....	9.5	.....	1,065,049.66	447,393.02
Halton.....	1907	99.0	.....	45.0	.....	1,244,694.88	530,276.38
Hastings.....	1904	342.0	.....	77.5	.....	1,227,146.49	497,928.74
Huron.....	1917	334.8	.....	98.4	.....	752,571.27	327,144.93
Kent.....	1917	163.0	8.7	71.8	6.0	1,319,672.48	665,541.71
Lambton.....	1918	244.0	3.0	91.0	.....	727,548.98	332,997.85
Lanark.....	1903	172.5	2.0	36.7	.....	1,005,185.93	427,793.42
Leeds and Grenville.....	1910	359.7	2.0	64.8	2.0	1,141,948.84	445,002.28
Lennox and Addington.....	1906	111.8	.....	71.5	.....	573,385.20	242,375.56
Lincoln.....	1904	165.0	13.5	.....	.....	2,038,889.73	793,526.61
Middlesex.....	1906	417.0	26.0	48.0	9.0	1,445,230.01	563,886.90
Norfolk.....	1917	208.0	.....	27.5	.....	1,096,224.28	489,247.37
Northumberland and Durham.....	1918	259.0	.....	105.0	.....	543,102.51	249,482.61
Ontario.....	1918	157.6	.....	60.8	.....	510,316.47	227,772.51
Oxford.....	1904-7	255.2	.....	31.2	.....	1,258,670.80	471,430.35
Peel.....	1906	137.0	.....	.....	.....	925,283.25	351,024.63
Perth.....	1907	205.3	.....	36.0	.....	701,163.50	273,660.78
Peterboro.....	1919	198.7	15.0	36.0	2.6	173,321.72	72,314.84
Prescott and Russell.....	1917	224.0	.....	8.0	.....	2,277,245.67	981,875.66
Prince Edward.....	1907	97.5	.....	32.0	.....	754,379.20	289,519.12
Renfrew.....	1918	172.5	.....	40.0	.....	1,353,657.69	648,117.40
Simcoe.....	1903	346.4	.....	94.3	.....	1,591,732.51	652,819.14
Stormont, Dundas and Glen- garry.....	1917	292.5	.....	122.0	.....	2,405,699.90	1,151,499.22
Victoria.....	1917	143.0	.....	80.0	.....	603,535.96	292,904.46
Waterloo.....	1908	141.8	13.0	36.5	7.0	938,874.21	413,118.53
Welland.....	1912	113.0	9.0	43.5	.....	2,126,653.93	899,884.93
Wellington.....	1903	273.3	9.5	59.2	5.5	1,225,338.94	492,769.10
Wentworth.....	1902	132.0	26.0	34.0	7.0	1,518,281.99	596,068.73
York.....	1911	.....	141.4	.....	44.0	3,391,272.93	1,404,546.00
		7356.5	400.5	1905.0	150.0	45,220,294.61	19,500,162.24

BRANT COUNTY

On the Ava road, adjoining the city of Brantford, one-half mile of concrete pavement 18 feet in width was constructed. The Van Horne bridge, consisting of one 80-foot span with steel superstructure, was built at a cost of \$7,475.00.

BRUCE COUNTY

On the Chesley-Tara road, approximately 2 miles of waterbound macadam road 16 feet in width were built. On the Hanover-Walkerton road, approximately $5\frac{1}{2}$ miles of gravel road 14 feet in width were constructed. On the Tiverton-North Bruce road, 9 miles were graded and gravelled 28 feet and 16 feet wide respectively. The Centre road through the swamp in Eastnor township was completed, a gravel top being placed on a rubble stone foundation. In a series of sections, varying in length from 2 to 5 miles, 19 miles of road were gravelled and approximately 100 miles of road graded to 24 feet in width. The Allenford bridge, consisting of a 90-foot concrete arch truss, was the largest bridge built during the year.

**ONTARIO PROVINCIAL HIGHWAYS**

The one-team steel drag is continually used to maintain gravel surfaces.

CARLETON COUNTY

On the Ottawa-Morrisburg road, known locally as the Metcalfe Road, the work of laying a waterbound macadam base course was continued, and approximately 5 miles of this construction was completed. In addition, 3 miles of bituminous macadam surface 16 feet in width were laid. On the Richmond Road extending south-westerly from Bell's Corners, 3 miles of bituminous macadam 14 feet in width were constructed and the grade widened to a width of 24 feet. Approximately 23 miles of waterbound macadam road were constructed in a series of sections varying in length from 2 to 4 miles. A 60-foot span steel superstructure known as the Porteous bridge was the largest bridge built during the year.

ELGIN COUNTY

The Stalter Gully bridge on County Road No. 42 in the township of Malahide was completed. The span is 304 feet supported on a steel tower resting on steel

cylinders filled with concrete and driven to a firm foundation. This bridge was constructed on a quicksand foundation of a very treacherous nature. The chief feature, however, in this county is the maintaining of gravel roads, which are kept in excellent shape at a very low expenditure. During the year approximately 150 miles of road were resurfaced with gravel.

ESSEX COUNTY

On the Front Road, Sandwich West, approximately $1\frac{1}{2}$ miles of concrete pavement 18 feet in width were laid from Turkey Creek southerly. From the village of Harrow easterly, 2 miles of concrete pavement 18 feet in width were laid and the grade widened to 28 feet. On the Tecumseh Road, the existing 18 foot concrete pavement was extended 3 miles from Rourk's Line easterly to the C.N.R. railway at Puce. The county of Essex built approximately 10 miles of concrete pavement during the year. In addition, 42 miles of gravel roads were constructed in a series of sections varying in length from 3 to 6 miles at a width of 12 feet.



WINDSOR-TALBOTVILLE PROVINCIAL HIGHWAY
Cement concrete pavement between Maidstone and Windsor.

GREY COUNTY

The Owen Sound-Meaford road for its entire length of 22 miles was surface treated with tar and sand. In addition, approximately 14 miles of gravel roads were built, and the grade widened to 24 feet.

HALDIMAND COUNTY

The outstanding feature was the grading of approximately 50 miles of road 24 feet in width, which now almost completes the grading of the County Road System. Approximately 15 miles of this fresh grading was resurfaced with crushed stone or gravel for a width of 12 feet. The McKenzie Creek bridge, consisting of a 50-foot span reinforced concrete structure with a 20-foot clear roadway, was built.

HALTON COUNTY

An 18-foot concrete pavement was built on the county road extending southerly from the village of Bronte to the lake, and on the continuation northerly of this road a 10-foot concrete pavement with 3-foot macadam shoulders was built for a distance of approximately one and one-half miles.

HURON COUNTY

In a series of sections, varying in length from 2 to 5 miles, approximately 27 miles of road were surfaced with gravel, and the grade widened to at least 24 feet. In addition, 25 reinforced concrete slab culverts were built.

KENT COUNTY

On the Wallaceburg-Dresden road, 5.25 miles of concrete pavement 16 feet in width were laid. This completes the concrete pavement extending between these two towns, a distance of approximately 12 miles. The 16-foot concrete pavement on the Dresden-Thamesville road was extended westerly a distance of 1.75 miles. On the Paincourt Road the 16-foot concrete pavement was extended approximately one mile, completing the concrete pavement from the village of Paincourt to the city of Chatham. In all, the County of Kent built 12.25 miles of concrete pavement during the year. In addition, approximately 25 miles of roads were gravelled for a width of 12 feet and graded to a width of 24 feet.



SARNIA-LONDON PROVINCIAL HIGHWAY
Cement concrete pavement extending easterly from Sarnia.

LAMBTON COUNTY

Approximately 2 miles of 18-foot concrete pavement were built from the southerly boundary of the county on the road known as the Wallaceburg-Sarnia road, the pavement being an extension of the concrete pavement built by the County of Kent. In addition, 18 miles of gravel roads were constructed in stretches varying in length from 1 to 4 miles and 46 reinforced concrete slab culverts were built during the year. The existing gravel roads to the extent of 75 miles were resurfaced for a width of 10 feet.

LANARK COUNTY

On the Perth-Lanark road extending northerly from the village of Balderson 2.5 miles of bituminous macadam road were laid, this being an extension of the bituminous macadam road laid in 1921. In addition, 2 miles of bituminous macadam road were built on the county road extending northerly from the

town of Carleton Place. In a series of sections approximately 16 miles were constructed, consisting of 12 miles of water-bound macadam and 4 miles of gravel.

LINCOLN COUNTY

In a series of sections, varying in length from 3 to 7 miles, 19 miles of water-bound macadam road from 10 to 18 feet in width were built and the grade widened to 24 feet. In addition, $5\frac{1}{2}$ miles of bituminous macadam road, 16 feet wide, were constructed.

MIDDLESEX COUNTY

Eighteen miles of gravel road were built, and 20 miles graded to a width of 24 feet. In addition, approximately 250 miles of gravel road were resurfaced. Nine bridges varying in span from 10 to 20 feet were built. The Brissley Bridge, consisting of 2 skew spans of 75 feet each was the largest bridge constructed.

NORFOLK COUNTY

On the Simcoe-Waterford road, 2.25 miles of bituminous macadam surface were laid extending northerly from the limits of the town of Simcoe. In addition, 2 miles of a similar pavement were laid northerly from the village of Port Rowan, and a water-bound macadam base laid for a further distance of $1\frac{1}{2}$ miles, which will be resurfaced with a bituminous macadam top in 1923.

ONTARIO COUNTY

On sections of the County Road System varying in length from 3 to 5 miles, approximately 23 miles of road were graded to a width of 24 feet; several excessive grades being reduced.

OXFORD COUNTY

Approximately 28 miles of road were resurfaced with crushed gravel. In addition, $22\frac{1}{2}$ miles of tile under-drains were laid.

PEEL COUNTY

In a series of sections varying from 2 to 5 miles in length, approximately 12 miles of gravel road were built.

COUNTIES OF PRESCOTT AND RUSSELL

On the Vankleek Hill-St. Eugene road, the present bituminous macadam pavement was extended 2.5 miles. In addition, approximately 34 miles of water-bound macadam road 10 feet wide were constructed. During the year 10 miles of road were graded to a width of 24 feet with adequate provision made for drainage. The La Fleche bridge in the village of Casselman consisting of 3 spans of 100 feet each, and a 90-foot span on County Road No. 4, township of East Hawkesbury, were the two most important bridges built during the year. Eight bridges varying in span from 10 to 18 feet were also built.

PRINCE EDWARD COUNTY

Approximately 12 miles of water-bound macadam road were built 10 feet wide and graded to a width of 22 feet.

RENFREW COUNTY

Approximately 40 miles of water-bound macadam and gravel roads were constructed in a series of sections varying from 3 to 5 miles in length. The material used was chiefly crushed field stone. The material as a rule is hauled to the road during the winter and crushed when the work is in progress.

SIMCOE COUNTY

The outstanding piece of work carried out in this county was the building of approximately 5 miles of gravel road between the villages of Singhampton and Maple Valley. The grade was widened to 28 feet and gravelled for a width of 16 feet; the grades were reduced to a minimum.

COUNTIES OF STORMONT, DUNDAS AND GLENGARRY

In a series of sections, varying in length from 3 to 6 miles, approximately 45 miles of water-bound macadam road 10 feet in width were constructed.



HAMILTON-KITCHENER PROVINCIAL HIGHWAY
Cement concrete surface, twenty feet wide, between Kitchener and Preston.

VICTORIA COUNTY

Approximately 2.50 miles of bituminous macadam road 16 feet in width were built; one-half mile on the road between Oakwood and Sonya and the remaining 2 miles on the Lindsay-Fenelon Falls road. On the Lindsay-Omemee road, approximately 2 miles of water-bound macadam base course were laid 16 feet in width, and it is anticipated that this will be resurfaced with a bituminous macadam top in 1923. In addition, 14 miles of road were graded to a width of 24 feet. The reduction of excessive grades was also given attention. A twelve per cent. grade through solid rock was reduced to a seven per cent. at a cost of approximately \$8,000; and Crawford's Hill, near the village of Omemee, was reduced from a sixteen per cent. to a seven per cent. at a cost of approximately \$11,000. In addition to the reduction of grades, special attention has been given to the improving the alignment of the road, especially at sharp and dangerous corners.

WATERLOO COUNTY

Approximately 3.50 miles of concrete pavement 16 to 20 feet in width were built; 2 miles being built on the Kitchener-Elmira road, and one-half mile on the Galt-Hespeler road south from Hespeler. Smaller stretches of pavement were built through the villages of Linwood, Hawkesville and West Montrose. Bridge construction consisted of a 100-foot span steel superstructure on the Baden-Wellesley road and one 30-foot span.

WELLAND COUNTY

On the Garrison Road 2 miles of bituminous macadam road, 16 feet in width, were constructed, this being a continuation of a similar pavement constructed in 1921. On the River Road extending west from Beckett's bridge, approximately 6 miles of water-bound macadam road 16 feet wide were constructed. In addition, approximately 15 miles of water-bound macadam road 9 feet in width were constructed on several of the other county roads. Approximately 40 miles of road were graded to a width varying from 24 to 28 feet.



HAMILTON-GUELPH PROVINCIAL HIGHWAY

Bituminous macadam surface between Clappison's Corners and Black's Corners on the townline between East Flamboro and West Flamboro Townships.

WELLINGTON COUNTY

The outstanding piece of work carried out in this county during the year was the building of the Belwood bridge, consisting of a steel superstructure of 50 foot span. In addition, 12 smaller reinforced concrete bridges varying in span from 20 to 80 feet were constructed.

WENTWORTH COUNTY

On the Binbrook Road, 1.6 miles of concrete pavement 10 feet wide with foot macadam shoulders were constructed. In addition, approximately 13 miles of water-bound macadam road 10 feet in width and graded to a width of 4 feet were constructed.

GENERAL

The work in the remaining counties consisted chiefly of reshaping and maintaining the existing roads, building permanent structures and otherwise preparing for future work.

SUBURBAN ROADS

The co-operation of cities has been secured in the construction and maintenance of the leading county roads radiating from the cities under a system of Suburban Roads as provided by the Ontario Highways Act.

Eighteen cities of the 21 within the organized counties of the Province are now paying towards the construction and maintenance of county suburban roads. In addition to these cities, the town of Smith's Falls is also contributing towards the cost of improving county roads in the vicinity of that town. The nineteen Commissions appointed have assumed 551 miles of road, the expenditure on which in 1922 amounted to \$1,574,691.41, of which the cities paid \$420,155.95.

The three cities which have not yet contributed towards the cost of the county roads are Stratford, Belleville and Woodstock, but it is expected that these cities will co-operate with the counties in the near future in improving the leading roads adjacent to the cities.

During the year, a Commission has been appointed to define the suburban roads adjacent to the town of Walkerville, but no mileage has been assumed.



KINGSTON-QUEBEC BOUNDARY PROVINCIAL HIGHWAY

A scenic section of the Provincial Highway along the St. Lawrence River. Waterbound macadam with bituminous surface treatment.

The main features of construction work carried out on suburban roads during 1922 are as follows:

TORONTO AND YORK ROADS COMMISSION

The City of Toronto contributes to the entire County Road System; the direction of the work, however, is under the control of the Commission. On the Sutton Road extending south from Queensville, an asphaltic concrete pavement 18 feet wide on a macadam base was built. North of Queensville a gravel road was built $2\frac{1}{2}$ miles in length and 16 feet in width. On the road extending west from the village of Sutton, 2 miles of water-bound macadam road 18 feet in width were laid. On the Lansing sideroad, one mile of asphaltic concrete pavement was built. In addition, three other stretches of asphaltic concrete pavement 2 miles in length were built on other parts of the system. In a series of sections, varying in length from one-half mile to one and one-half miles, approximately 6 miles of 16-foot bituminous macadam road were built;

also, in stretches varying from one-half to $3\frac{1}{2}$ miles in length, approximately $15\frac{1}{2}$ miles of water-bound macadam road 15 feet in width were built. The superstructure of the Cronsberry bridge was completed at a cost of \$9,148.00; the building of this bridge was commenced in 1921. In addition, 6 bridges varying in span from 15 to 22 feet were built.

OTTAWA SUBURBAN ROADS COMMISSION

On the Ottawa-Morrisburg road, locally known as the Metcalfe Road, approximately 3 miles of asphaltic concrete pavement 20 feet wide were laid on a macadam foundation. This type of pavement was also laid on a part of the Richmond and Merrivale Roads, approximately 1 mile on the Richmond Road and 0.8 miles on the Merrivale Road. A bituminous macadam road 18 feet in width was built at the westerly end of the Richmond Road. A



TORONTO AND HAMILTON HIGHWAY

One of the two bridges constructed by the City of Hamilton, on the entrance of the Toronto and Hamilton Highway and the Hamilton-Guelph Provincial Highway into the City of Hamilton.

macadam road 18 feet in width was laid on the Russell Road for a length of 4 miles. The remaining mileage of the system, consisting of macadam roads, were given a surface treatment of oil and kept in excellent shape by constant maintenance.

HAMILTON SUBURBAN ROADS COMMISSION

On the Binbrook Road, 1.25 miles of concrete pavement 9 feet wide with 4-foot macadam shoulders were built.

LONDON SUBURBAN ROADS COMMISSION

The pipe line road extending from the city limits of London to Springbank Park was graded for a width of 28 feet and for a length of 2 miles in preparation for a concrete pavement to be built in 1923.

BRANTFORD SUBURBAN ROADS COMMISSION

On the Burford Road 2.5 miles of 9-foot concrete pavement with a 10-foot strip of gravel road adjoining were laid. In addition, hill cutting and grading were carried out on the Cockshutt Road.

WINDSOR SUBURBAN ROADS COMMISSION

Approximately 2.5 miles of concrete pavement 18 feet in width were built on the Tecumseh Road extending from Little River to the C. N. Railway crossing at Tecumseh.

OWEN SOUND SUBURBAN ROADS COMMISSION

On the suburban road within the township of Derby, approximately 1.25 miles of concrete pavement 9 feet in width were built, with 4-foot macadam shoulders adjoining.

CHATHAM SUBURBAN ROADS COMMISSION

On the Chatham-Wallaceburg road 1.5 miles of 18-foot concrete pavement were laid and the road graded to a width of 28 feet.

KITCHENER SUBURBAN ROADS COMMISSION

On the Kitchener-Bridgeport Road a concrete pavement 20 feet in width and 850 feet in length was built. In addition, a retaining wall and a 6-foot concrete slab culvert were built in the village of Bridgeport.

GALT SUBURBAN ROADS COMMISSION

On East Main Street, 1,200 feet of asphaltic concrete pavement 20 feet in width were built.

NIAGARA FALLS SUBURBAN ROADS COMMISSION

Approximately 4 miles of bituminous macadam road 18 feet in width were built, one section extending from the city of Niagara Falls to the village of Chippawa, and a short section from the city of Niagara Falls northerly to the Provincial Highway.

WELLAND SUBURBAN ROADS COMMISSION

On the Crowland Road, 2.5 miles of bituminous macadam 16 feet in width were constructed westerly from the city of Welland and on the Fonthill Road approximately 2 miles of bituminous macadam surface were built.

TOWNSHIP ROADS

Township councils, in the earlier history of the Province, depended solely on statute labour for road improvement, no doubt a wise course to adopt in those days, but with the change in traffic conditions on our roads within the present decade it has been found that statute labour is not a sound basis on which to build or maintain the majority of our roads. Money expenditure, raised by general levy on the township assessment, has been steadily increasing. In 1913 the expenditure on township roads within the organized counties was in the neighbourhood of \$2,000,000, while in 1922 approximately \$4,000,000

was expended. The influence of the war on township road expenditure was very apparent during the years 1915, 1916, 1917 and 1918. The expenditure per year during these years was approximately \$1,000,000 less than each of the previous years 1913 and 1914. Scarcity of farm labour together with the high cost of material rendered it necessary to limit road work throughout these years. With a return to normal conditions in 1919, we again saw increased expenditure being made by the majority of the townships.

In 1922, 313 townships, or 84.0 per cent. of the townships eligible for the Provincial subsidy, as provided in The Ontario Highways Act, 1920, passed the necessary by-laws and fulfilled the requirements of the Act, and expended \$3,092,304.53 on the improvement of township roads, on which the Province paid \$618,460.91. All townships that are not receiving aid under the Colonization Roads Act are entitled to pass by-laws and receive the aid as provided in the Ontario Highways Act. The Act provides that a subsidy of 20 per cent. will be paid on the cost of construction, maintenance, bridges and mach-



SOUTH DORCHESTER TOWNSHIP ROAD

A well graded and gravelled road constructed by the Township of South Dorchester in Elgin County.

inery, and a subsidy of 40 per cent. of the expenditure on superintendence. In 1922 the expenditure on superintendence amounted to \$77,801.44, of which the Province paid \$31,120.57.

In 1920, the first year in which the Provincial subsidy of 20 per cent. was available, 184 townships passed the necessary by-laws and took advantage of the Government aid. In 1921, 294 townships passed by-laws and, as mentioned above, 313 townships passed by-laws in 1922, and it is expected that in 1923 this number will be further increased. The Government subsidy is very much appreciated by the township councils, the majority of which are exceedingly anxious to adopt a system for the betterment of road conditions.

Apart from the actual financial aid to townships, one of the chief merits of this assistance is that it is enabling the Department to bring definite organizing and technical advice to the township council, which advice has been very much appreciated by the townships in which this assistance has been given. With the aid of the subsidy from the Province, coupled with the growth of the County

Road System relieving the townships from the task of financing the more heavily travelled roads, the betterment of township road conditions is looked for. At this date, marked improvement is noticed in many townships, particularly in bridge and culvert construction, the elimination of dangerous curves, widening of roads where traffic demands, and the method of keeping road accounts. Generally speaking, the method of keeping account of road expenditures in many townships has been found to be inadequate. The treasurer or road superintendent has in these townships an unenviable task of endeavouring to segregate road expenditures and of distributing them to the roads on which the expenditure was made, in compliance with the requirements of the Department. A standard system of road accounting for the township is of vital importance, and the Department of Highways has prepared a simple form for keeping such accounts and has appointed Clerical Inspectors for the purpose of laying the matter before the township officials. These inspectors have been appointed, not for the purpose of criticising the accounting system, but as a guide and assistance to the township officials in establishing a proper system, and for the purpose of obtaining for the Department accurate information with respect to road expenditure.

Out of the 374 townships which are eligible for the Provincial subsidy under the Ontario Highways Act, we find that 204 townships, or 55 per cent., have abolished or commuted Statute Labour, and it is confidently expected that many other townships will in the near future abandon the old system of doing road work. The subsidy of 20 per cent. is paid on the cash expenditure made by the township; in other words, the expenditure on work carried out under the Statute Labour system is not eligible for this grant.

The services of the engineers of this Department are at the disposal of the township councils and officials at all times, and the township officials are advised to get in touch with the Department in all matters pertaining to road improvement. It is the desire of the Department to render assistance where most needed and to co-operate at all times with the councils and officials in endeavouring to establish a system for the betterment of township road conditions throughout the Province.

TRAFFIC AND ROAD DESIGN.

Choices of designs of roads and road surfaces must be made with careful consideration of not only the immediate increase in traffic that will follow road improvement, but there must always be kept in mind the ultimate traffic that the road will eventually be called upon to serve. Traffic must be considered from three distinct viewpoints. First, existing traffic; second, immediate future traffic, i.e., the traffic that will immediately concentrate upon the improved road from adjacent parallel roads; and third, the potential traffic, or the traffic that will originate from within an area served by the improved road as a result of the increase in population or industrial activity consequent upon such improvement. Experience has shown that the construction of a substantial surface on a main road brings, as a direct result, an increase in settlement along the road. While true in all districts, it is particularly noticeable in the areas adjacent to cities and towns. Probably the most outstanding example of this, in Ontario, is the increase in population which followed the construction of the Toronto and Hamilton Highway in the years 1915, 1916 and 1917. Not only has the through traffic between the two cities increased, but the local traffic originating from

the communities that have sprung up has swelled the volume of traffic on the road to a degree exceeding all expectation.

Traffic counts are, therefore, of inestimable value in furnishing information regarding not only the extent but also the character of traffic that a road is required to carry. A census of the traffic is obtained by stationing observers at points along the road, who record under the proper classification all vehicles passing the observing station in both directions. Since traffic varies from day to day, it is customary to extend the period of observation over an entire week, including a national holiday, such as Labour Day. This enables the maximum daily traffic to be determined.

In the year 1914, a traffic census was taken by the Department on the main roads of the Province, most of which were County Roads and which had for the most part been improved. Counts were taken at 210 points, chiefly on roads leading from the cities. Traffic was classified under the following:—

- 1-horse light vehicles
- 1-horse heavy vehicles
- 2-horse light vehicles
- 2-horse heavy vehicles
- Runabout motor cars
- Touring motor cars
- Motor trucks.

A detailed report of the results of this census was published in the Annual Report of the Department for 1915.

TRAFFIC CENSUS IN 1922.

The number of motor vehicles registered in Ontario has increased from 31,724 in 1914 to 239,296 in 1922, an increase of 655.0 per cent. Counties and townships have made a great advance in the improvement of their roads, the county road mileage increasing from 4,125 miles in 1915 to 9,812 in 1922. In addition, Provincial Highways comprising 1,823 miles have been assumed and largely improved by the Province. A heavy increase in traffic would therefore be expected, particularly on the Provincial Highways to which the county and township roads are feeders.

In order to determine the increase in traffic on the Provincial Highways, which has taken place as a result of the causes mentioned, a general census was taken during the last days of August and the first days of September, 1922. Observers were stationed as far as possible at the same points as in 1914, in order to enable comparisons to be made with the 1914 census. In addition, observations were made at points distant between the cities, these giving the count of the through traffic. Ninety-two stations were established, forty-five being located as in 1914 and forty-seven where no previous census had been obtained. While the 1914 census was taken for a period of 12 hours from 7 a.m. to 7 p.m., in 1922 it was necessary, owing to the prevalence of night traffic, to extend the time from 6 a.m. to 10 p.m.

One important factor that must be borne in mind when considering the figures obtained in 1922 is the influence on traffic of the construction work then being carried out on the Provincial Highways. On most of the roads, grading and surfacing was being done, and traffic was, of necessity, diverted to adjacent county or township roads. As a result, a considerable amount of traffic left the Provincial Highways and did not return to them before passing the observing stations. While the observation points were chosen with a view to avoiding

this factor as much as possible, there is no doubt that, at some points at least, the amount of traffic was considerably less than it would have been had there been no disturbance due to construction operations.

Details of the result of the counts at the above points are shown in Appendix No. 6 of this report. Mention might be made, however, of the enormous increase in traffic on the Toronto and Hamilton Highway at Long Branch Park. In 1914 the average daily traffic was 286.8, the maximum in one day being 382. In 1922, at the same point, the average daily was 8,236.4, with a maximum on Labour Day of 12,296. Trucks in 1914 numbered 14.4 per day and in 1922 there were 328.3 per day.

On the Hamilton-Queenston road at Fruitland in 1914 the count gave an average daily traffic of 189.0 vehicles, with a maximum of 236.0 vehicles. In 1922 at the same point the average daily traffic was 2,849.8 and the maximum daily 5,029 vehicles. The uniformity in the volume of traffic over this road is deserving of notice, the average daily at three points being 2,849.8, 2,318.1 and 2,341.7 vehicles, respectively.



OTTAWA-KINGSTON PROVINCIAL HIGHWAY
Asphaltic concrete surface under construction west of Ottawa.

On the Ottawa-Prescott road, at the junction with the Ottawa-Kingston road, the average daily traffic in 1914 was 94.4, as compared with 530.3 in 1922, and on the Ottawa-Point Fortune road the count, near Ottawa, gave a daily average of 1,143.3 in 1922 as compared with 203.0 in 1914.

At Lambeth on the Lambeth-Maidstone road in 1914, there was a daily average of 102.0 and in 1922 the daily average was 1,026.3.

COMPARISON WITH TRAFFIC IN NEW YORK STATE.

Statements are frequently made that in Ontario the traffic on the main roads does not attain such a large volume as that on the roads in the United States. A comparison between the traffic on the more heavily travelled Provincial Highways and some of the New York State roads would seem to indicate that some roads in Ontario, at least, are called upon to carry as much traffic as the more heavily travelled roads in New York State. During the

month of August in 1922, at approximately the same time as the census in Ontario, a traffic census was taken on the roads in New York State, and while only a 12-hour period was covered by the census, as compared with a 16-hour period in Ontario, a comparison shows that the traffic on some Provincial Highways is of approximately the same magnitude as that on the main roads in New York State.

On the State Highway between Buffalo and Niagara Falls, N.Y., the average daily traffic was 2,519 vehicles. On the Hamilton-Queenston Provincial Highway, which connects with the above road at Niagara Falls and at Queenston, an average daily traffic of 2,342 was observed at a point west of the city of St. Catharines. The heaviest average daily traffic recorded in the vicinity of Rochester was 5,290. This was on the road leading from Rochester to Fairport. In comparison with this the traffic on the Toronto and Hamilton Highway at a point $1\frac{1}{2}$ miles east of the city of Hamilton might be considered. This reached an average of 5,937 vehicles per day.

On only two roads in New York State was there an average daily traffic greater than that on the Toronto and Hamilton Highway past Long Branch Park, which was 8,236 vehicles per day. These roads are immediately adjacent to the city of New York and the average traffic was 13,296 and 13,489 vehicles per day respectively.

While making the above comparisons, mention must be made of the uniformly heavy traffic on all the main roads in the State of New York. Between Syracuse and Utica the minimum average daily traffic was 2,021, and between Syracuse and Watertown the daily average did not fall below 1,509. The State of New York has been improving its main and secondary roads for a number of years and the heavy traffic observed leading to outlying points is an indication of what will no doubt take place in Ontario, following the construction of improved surfaces on the Provincial Highways, County and Township Roads.

It will be seen from the above figures, as well as from the detailed report following, that the construction of roads in Ontario must be carried on with a full realization of the enormous increase in the traffic which these roads will be called upon to carry, and the probable future development of traffic, as indicated from the experiences of the past, cannot be neglected and must not be underestimated.

REGISTRATION OF MOTOR VEHICLES.

The number of motor vehicles registered in the Province is fully keeping pace with expectations. The following table shows the registration in Ontario for the years 1904 to 1922 inclusive. From the figures given it is evident that the number of motor vehicles registered in the Province has doubled during the past four years and has almost trebled since 1917.

The relation of the number of motor cars in the Province to the population of the Province is interesting. The population of Ontario as given by the Dominion Census of 1911 was 2,527,292. During that year there were registered in the Province of Ontario a total of 11,339 motor vehicles or 1 motor vehicle for every 223 of population, or 4.5 motor vehicles per thousand.

The population of Ontario according to the Federal Census of 1921 was 3,333,662 and the number of motor vehicles registered during that year was 66,521. This is on the basis of one motor vehicle for every 14.5 of population or 70 motor vehicles per thousand of population, which is $15\frac{1}{2}$ times as many per thousand of population as were registered in 1911.

Prior to the year 1916 all commercial vehicles and passenger cars were registered together. Commencing with 1916, separate markers were issued for commercial cars and in that year 2,786 were registered. In 1922 there were 24,164 commercial cars, or approximately ten times as many as in 1916. This indicates the rapid increase in the use of motor trucks in the handling of merchandise, etc., in Ontario.

MOTOR VEHICLE REGISTRATION FOR THE YEARS 1904-1922 INCLUSIVE

Year	Passenger cars	Commercial cars	Motorcycles	Totals
1904	535	.....	.....	535
1905	553	.....	.....	553
1906	1,176	.....	.....	1,176
1907	1,530	.....	.....	1,530
1908	1,754	.....	.....	1,754
1909	2,452	.....	.....	2,452
1910	4,230	.....	.....	4,230
1911	11,339	.....	.....	11,339
1912	16,266	.....	1,754	18,020
1913	23,700	.....	2,900	26,500
1914	31,724	.....	3,633	35,357
1915	42,346	.....	4,174	46,520
1916	51,589	2,786	4,287	58,662
1917	78,861	4,929	5,180	88,970
1918	101,845	7,529	5,002	114,376
1919	127,860	11,428	5,516	144,804
1920	155,861	16,204	5,496	177,561
1921	181,978	19,554	4,989	206,521
1922	210,333	24,164	4,799	239,296

REPORT ON PROVINCIAL HIGHWAYS

BY THE CHIEF ENGINEER

W. A. McLEAN, ESQ.,
Deputy Minister of Highways, Ontario.

TORONTO, January 30th, 1923.

DEAR SIR:—

I have the honour to report upon the work of constructing and maintaining the Provincial Highway System in the Counties of Ontario for the year beginning December 1st, 1921, and ending December 31st, 1922.

On December 1st, 1921, the system comprised a total mileage of 1,765.80 miles. During the year the system was extended by adding 81.89 miles assumed as shown on Map No. 1, less 10.85 miles reverted, making a total assumed of 1,836.84 miles, as shown on Map No. 2. A list of the roads added to the system, together with the mileage and date of designation, is as follows:—

PROVINCIAL HIGHWAYS ASSUMED IN 1922

County	Date of Designation	Municipality	Mileage	Total Mileage
Brant.....	26th of October, 1922.....	Paris Town.....	.48	.48
Carleton.....	28th of January, 1922.....	Nepean.....	1.27	.....
	28th of January, 1922.....	North Gower.....	.34	1.61
Durham.....	25th of February, 1922.....	Bowmanville Town.....	.06	.....
	29th of July, 1922.....	Hope.....	2.61	.....
	23rd of September, 1922.....	Newcastle Village.....	.32	2.99
Essex.....	17th of October, 1922.....	Essex Town.....	1.15	1.15
Frontenac.....	16th of November, 1921.....	Pittsburg.....	20.00	20.00
Grenville.....	16th of September, 1922.....	Prescott Town.....	.25	.25
Kent.....	6th of June, 1922.....	Thamesville Village.....	.73	.73
Lennox and Addington.....	28th of November, 1921.....	Napanee Town.....	.14	.14
Lincoln.....	1st of July, 1922.....	Beamsville Village.....	.67	.....
	1st of July, 1922.....	Grimsby Village.....	.55	1.22
Norfolk.....	8th of August, 1922.....	Simcoe Town.....	.12	.12
Ontario.....	14th of January, 1922.....	Whitby.....	9.29	.....
	14th of January, 1922.....	Reach.....	12.73	.....
	14th of January, 1922.....	Brock.....	11.00	.....
	17th of June, 1922.....	Whitby Town.....	.88	33.90
Oxford.....	1st of July, 1922.....	Ingersoll Town.....	.60	.60
Perth.....	10th of June, 1922.....	Mitchell Town.....	.30	.30
Prescott.....		L'Orignal Town.....	.55	.....
	4th of November, 1922.....	L'Orignal Town.....	.15	.70
Renfrew.....	17th of June, 1922.....	Pembroke Town.....	.57	.....
	18th of November, 1922.....	Renfrew Town.....	.36	.93
Simcoe.....	17th of January, 1922.....	Barrie Town.....	1.77	.....
	15th of August, 1922.....	Bradford Village.....	.22	.....
	28th of January, 1922.....	Orillia Town.....	1.25	3.24
Victoria.....	14th of January, 1922.....	Mariposa.....	8.71	.....
	14th of January, 1922.....	Ops.....	3.87	12.58
Waterloo.....	27th of November, 1922.....	Dumfries North.....	.46	.46
Wellington.....	5th of July, 1922.....	Fergus Village.....	.49	.49
				81.89

Reversions from December 1st, 1921, to December 31st, 1922

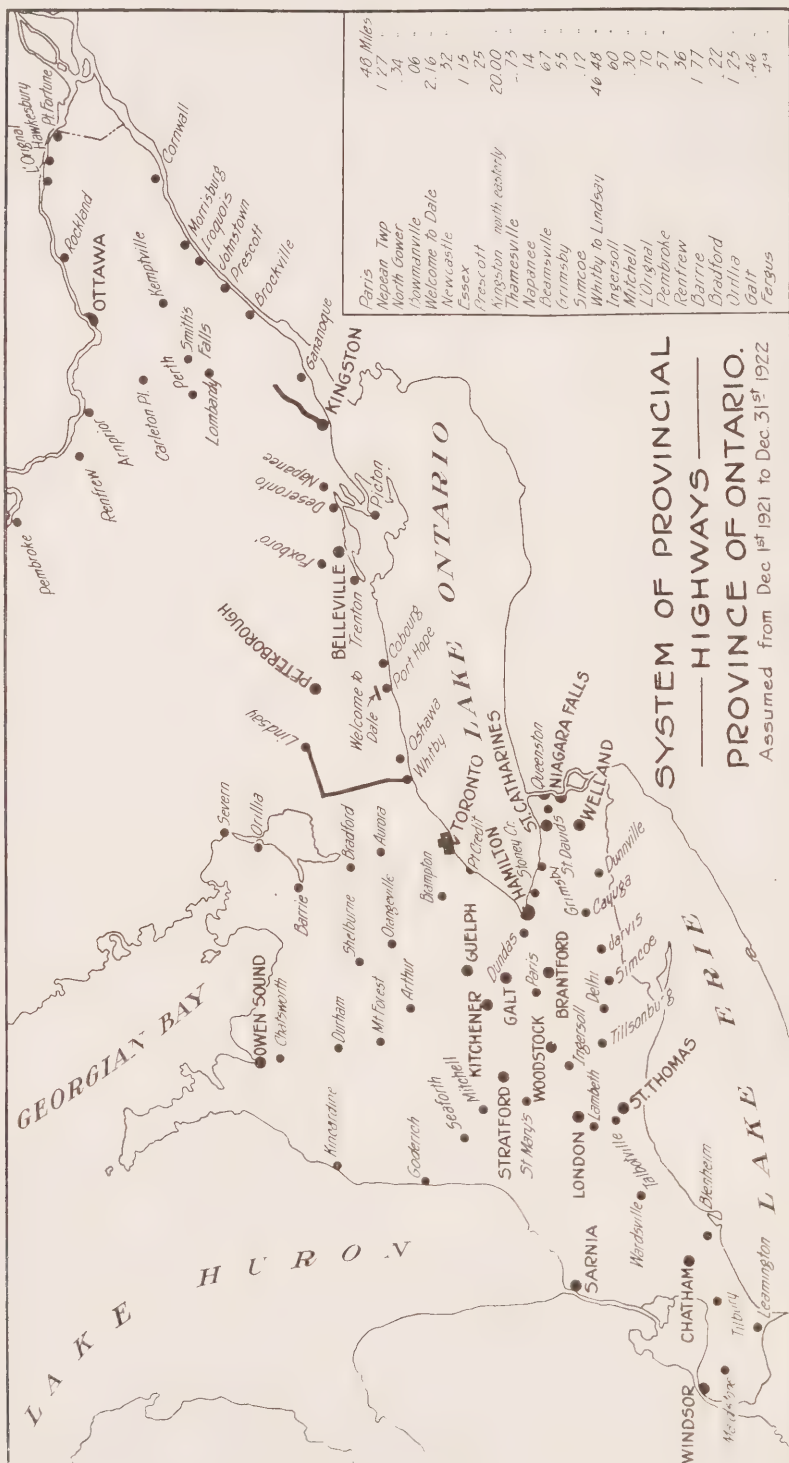
County	Municipality	Mileage	Total mileage
Carleton.....	Nepean.....	2.19	10.85
	Huntley.....	7.65	
	North Gower.....	.70	
	Ottawa City.....	.31	

The highways added to the system during the year are shown with their location on Map No. 1.

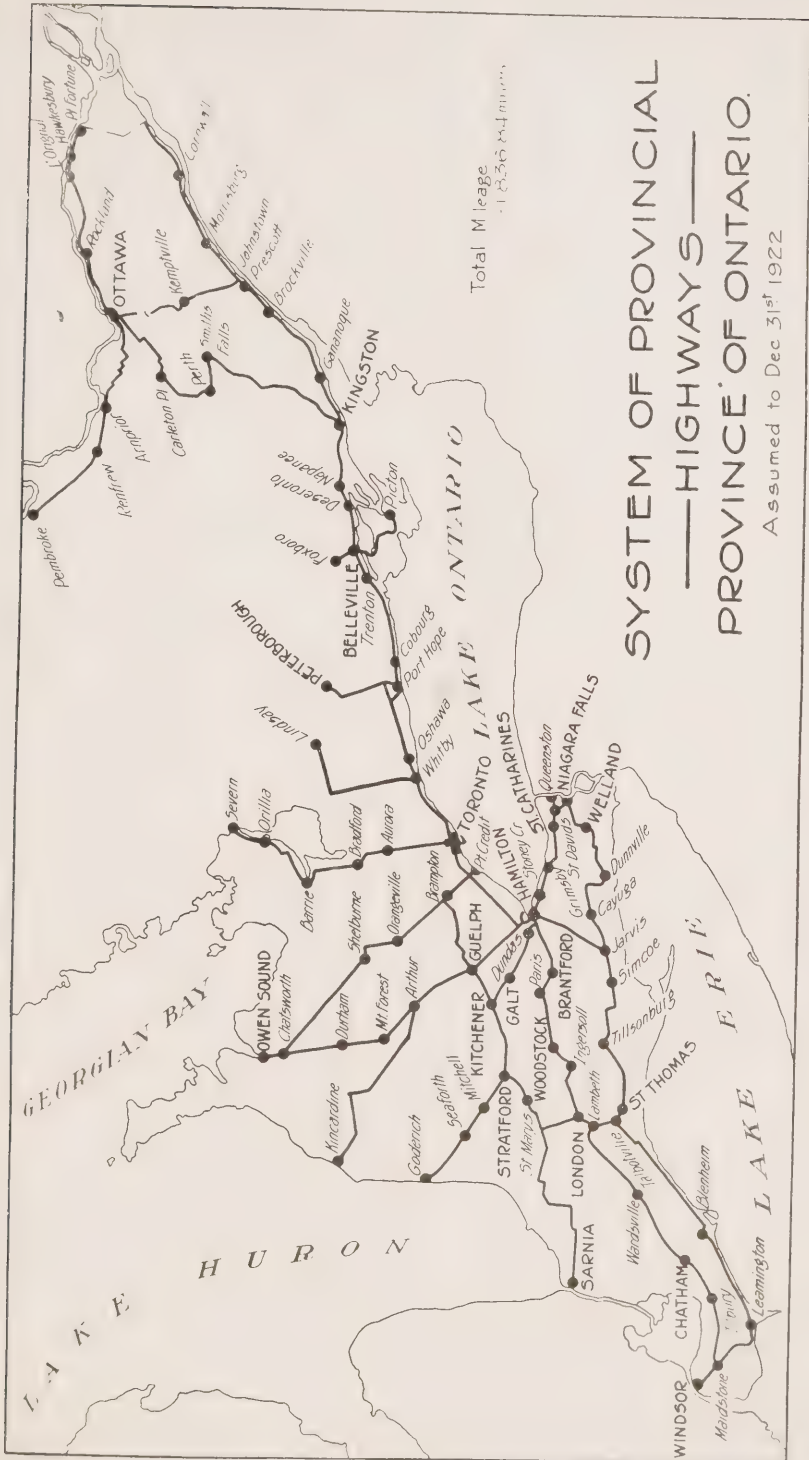
A continuation of construction of paved roads in the suburban areas adjacent to cities was carried out, while macadam surfaces, macadam base courses and gravel roads were proceeded with to link up and connect the different parts of the system.

Gravel road maintenance, using thin layers of gravel and frequent dragging, resulted in a smooth surface being kept in good condition for travel. To prevent the dust nuisance on gravel roads during dry summer weather, calcium chloride was applied as an experiment to several sections with good results.

A summary of the work done in the various counties is as follows:—



MAP No. 1.





OLD TYPE OF BRIDGE

Many bridges of this type, with wooden trusses, totally enclosed, were constructed in Ontario. They are rapidly being replaced by modern structures of steel and concrete.

COUNTY AND TOWNSHIP ROADS

REPORTS OF DISTRICT ENGINEERS

TORONTO, February 1st, 1923.

W. A. McLEAN, Esq.,
Deputy Minister of Highways, Ontario.

SIR:

I beg to report the following summary of the work performed on the municipal roads of York and Peel Counties during the year 1922.

Respectfully submitted,

ARTHUR SEDGWICK,
District Engineer of Municipal Roads.

YORK COUNTY

On Provincial County Roads the more important work consisted of 2.08 miles of asphaltic concrete construction southerly from Queensville at a cost of \$77,410.40; 2.15 miles of water-bound macadam westerly from Sutton at a cost of \$42,239.50; and 1.91 miles of grading and gravelling in several shorter sections at a cost of \$7,763.13. The total construction charges on these roads amounted to \$127,413.03. The superstructure of the Cronsberry bridge north of Pefferlaw was completed at a cost of \$9,148.74. The substructure for this bridge was put in during 1921, costing \$18,226.17, making a total cost for the completed bridge of \$27,374.91. This bridge consists of a 100-ft. span reinforced concrete bowstring arch with 20-foot roadway, which, with the Davies bridge on the Don Mills Road completed in 1921, makes an imposing link in the County Road System. Maintenance costs on Provincial County Roads amounted to \$12,508.99.

On County Roads, 1.88 miles of asphaltic concrete pavement were constructed at a cost of \$70,572.27. This work is located in three sections, 2,187 feet of 20-foot pavement in Aurora; 5,855 feet of 18-foot pavement in Con. 1, E. York easterly from Lansing, and 1,700 feet of 17-foot pavement on the Scarlett Road northerly from Lambton Mills. Bituminous macadam was also constructed to the extent of 3.75 miles at a cost of \$100,931.16. This work was located at the following points: Southerly from Unionville, 1 1/8 miles; on the Vaughan Road, 1 1/4 miles northerly from the York Mills-Downsview sideroad; 4,464 feet on the Weston Road south of Weston, and 3,179 feet on the Don Mills Road between Pape Avenue and Taylor's Hill. In addition, 17.07 miles of waterbound macadam and base course, and 5.51 miles of gravel road

were constructed. This class of work is carried out in the upper half of the county where traffic is not so heavy as in the portions closer to Toronto. The total expenditure for construction on County Roads amounted to \$445,135.12. Bridge construction amounted to \$7,700.59. Maintenance expenditure on County Roads was \$49,287.34, chiefly for resurfacing and oiling.

All the townships participated in Government aid. The expenditure in the townships of Etobicoke, York and Scarborough surrounding Toronto reached the total of \$273,278.50, chiefly for repair of roads and streets. The expenditure on the outlying townships away from the dense city traffic was relatively much lighter. A notable piece of work was the extension westerly to Yonge Street of the townline between Markham and Whitechurch townships. Scarborough township constructed 6 bridges ranging from 12 to 30-foot span and 24 to 28-foot roadway, at a total cost of \$24,826.75.

PEEL COUNTY

On Peel County roads, 21.25 miles of new gravel construction were completed, comprising 5.25 miles in Toronto township; 6.5 miles in Chinguacousy; 2.75 miles in Caledon; 3.25 miles in Toronto Gore and 3.5 miles in Albion. In addition, 4.75 miles of grading were carried out and 61 culverts were built. The total spent for road construction amounted to \$59,046.27. Two bridges were constructed in Toronto township, one being a 20-foot reinforced concrete span and the other a 40-foot old steel span placed on new concrete abutments, the two costing \$4,785.84.

Road maintenance, chiefly for resurfacing, cost \$29,064.30.

All the townships participated in Government aid. The work consisted chiefly of the construction of culverts and maintenance of earth and gravel roads. Toronto township, however, did 8 miles of gravel surfacing at a cost of some \$10,000.

W. A. McLEAN, Esq.,
Deputy Minister of Highways, Ontario.

TORONTO, February 1st, 1923.

SIR:

I have the honour to submit a summary report of the work carried out on County and Township Roads in the counties of Essex, Elgin, Kent, Lambton, and Middlesex, in accordance with the provisions of The Highway Improvement Act and The Ontario Highways Act.

Labour conditions during 1922 in the various counties were better than in 1921. The work carried out, especially by contract, appeared to cost less than the estimates. A higher standard of efficiency was noted both in the work of teams and men.

It is gratifying to note that generally the County work showed improvement. Maintenance work is being given a more prominent place, both in the estimates and in the consideration of County officials. The grading, hill cutting and widening out of narrow places was done with marked improvement. Kent County's programme of concrete highways was added to by the extent of 12 miles during 1922. Essex County built about 10 miles.

Fifty-five townships out of the fifty-seven availed themselves of the Government subsidy. Statute Labour is gradually losing ground and the results shown by near-by townships which have placed their organization on a cash basis is bringing good results and is an excellent example to those townships who still retain it.

In the following summary I have made a brief synopsis of each of the individual townships in this district.

In addition to the regular Departmental inspection, a number of special visits were made during the year at the request of County and Township officials when matters of special importance were being considered. The assistance of the Department in all cases appeared to be very much appreciated.

All of which is respectfully submitted.

J. A. P. MARSHALL,
District Engineer of Municipal Roads.

ESSEX COUNTY

During 1922, Essex County constructed 10 miles of paved roads and about 42 miles of gravel roads, in addition to the resurfacing of about 355 miles previously graded.

Seven concrete culverts were constructed and 27 pipe and tile culverts installed. Fourteen miles of grading was also done during 1922. This grading was particularly well done and is a credit to the County organization.

On Provincial County Road No. 77 on the Windsor-Amherstburg Front Road in Sandwich East, 13 miles of concrete was constructed from Turkey Creek southerly. In Colchester South on Hurrow easterly two miles of concrete was laid also on this Provincial County Road. On Provincial County Road No. 86 (Tecumseh Road), 2.69 miles of concrete road was constructed, from Rourke's Line easterly to the G.T.R. at Puce.

The work done within the Windsor suburban area for 1922 consisted of the paving with concrete of the Tecumseh Road (Provincial County Road No. 86, from Little River in the township of Sandwich East to the G.T. Railway crossing in Tecumseh, a distance of 2.27 miles.

Considerable drainage and gravelling was done on Road No. 2 at and near the Canard Church. All outstanding accounts have been settled up and the Suburban Area Commission are planning an extensive programme for 1923.

In the town of Kingsville, on Main Street, from the western limits easterly for a distance of 1,991 feet and from the eastern limits westerly for a distance of 2,453 feet, a two-inch stone-filled asphalt top surface was laid on six-inch concrete base for a width of 18 feet. This work was done under agreement by the County and the town of Kingsville.

In the town of Essex, on Victoria Avenue, for a distance of 2,440 feet, and also on Arthur Avenue for a distance of 2,200 feet, a concrete roadway 18 feet in width was laid by the County, also under an agreement. These are extensions of County Roads No. 41 and No. 7.

With the equipment that Essex County have in their gravel pit at Leamington, and the shipping facilities, they should be able to distribute gravel to any part of the County Road System at reasonable cost. The major portion of the material can be delivered at railway points within a reasonable team haul to their roads, in this manner giving employment to local teams.

During the season, 1,350 carloads of gravel averaging 40 yards to the car were shipped out of the County pit. 570 cars of gravel were shipped to the Department of Highways for use on Provincial Highways in the County and to the several municipalities requiring gravel.

The mileage of County Roads in Essex is 277, of which 170 miles have been surfaced with gravel or paved to the end of 1922, or 61.4 per cent. of the County System.

TOWNSHIP WORK

Anderdon Township

Statute labour abolished in 1916. The work is in charge of the reeve and councillors. All the roads here are of clay and the most of the work consists in grading and dragging. Considerable ditching has been done throughout this township. During the year two bridges were built.

Colchester North Township

Statute labour is still retained. There are approximately 3,000 days. There are 24 road divisions. Considerable drainage work has been done. 1922 was the first year for this township to take aid under The Ontario Highways Act.

Colchester South Township

Statute labour abolished in 1919. There is a township road superintendent in charge and about 50 per cent. of the roads are gravelled. During 1922 about 8 miles of new gravelling has been done. During 1922 this township participated in a Government loan of \$10,000 for road work.

Gosfield North Township

Statute labour is still retained. There are approximately 2,500 days. There are 43 road divisions. Considerable gravelling has been done. During the year this township borrowed \$3,000 for the purchase of a gravel pit.

Gosfield South Township

Statute labour was abolished in 1903. The road work is in charge of a township road superintendent. The township is well organized and systematic work is being carried out throughout the township. The township owns its own gravel pits. During 1922 considerable gravelling has been done.

Maidstone Township

Statute labour was abolished in 1910. The roadwork is in charge of a township road superintendent, who is also the clerk of the township. Good system of accounting here is in force.

Mersea Township

Statute labour is still retained. There are approximately 6,000 days and 100 divisions. About 50 per cent. of the township road mileage has been surfaced with gravel. The township owns 5 gravel pits. Considerable drainage work has been done.

Rochester Township

Statute labour was abolished in 1910. The road work is in charge of a township road superintendent. Considerable grading has been done during 1922. Roads are mostly clay.

Sandwich East Township

Statute labour is still retained. There are approximately 3,600 days with 40 divisions. Roads are chiefly gravel.

Tilbury North Township

Statute labour abolished in 1914. The road work is in charge of a township road superintendent. The roads are chiefly clay.

Tilbury West Township

Tilbury West abolished statute labour during 1922 and appointed a road superintendent. During the year 10 miles of gravelling has been done and an extensive programme has been laid out for 1923.

Pelee Island Township

Pelee Island commuted statute labour in 1918. The roads here are in fair condition. Approximately half of the rural mileage of 50 miles has been surfaced.

ELGIN COUNTY

The county of Elgin during 1922 carried out their usual systematic maintenance of gravel roads under the County Road system. During 1922 thirty-eight miles were added to the County System. The Stalter Gully bridge in the southern part of Malahide township on County Road No. 42 was commenced. The cost of this work is proportioned 30 per cent. to the township of Malahide, under Section 26 of The Highway Improvement Act, 30 per cent. to the county of Elgin and 40 per cent. to the Province of Ontario. The span is 304 feet, supported by a steel tower resting on steel cylinders filled with concrete and driven to hard clay. On account of the nature of the foundation soil here, pneumatic caissons were driven through the quicksand into the hard clay and filled with concrete.

One hundred and fifty miles of county roads have been resurfaced during the season with gravel and broken stone, also the entire length of road grade as above has been trimmed up with heavy graders. A number of narrow culverts have been widened by placing new pipes at either end.

Daily record was kept of the mileage and quantity of gravel drawn by the three county trucks in operation from May 15th to November 15th. The number of cords of gravel hauled was 2,181 and the average mileage per day was 71.5 miles, hauling 4.75 cords of gravel; and allowing \$20.00 per day for depreciation, the cost of hauling 1 cord of gravel 1 mile was \$1.20. The average cost for the three years, 1920, 1921, and 1922, is \$1.13 per cord mile.

The Roloson gravel pit in the township of Dereham, in Oxford County, was purchased during 1922.

The management of the County Road System is well organized, the efficient patrol system numbering 86 patrolmen, averaging three and a half miles to each section. Each of these patrolmen has the usual equipment of either a road drag or a junior grader, a shovel, rake, etc. Other counties would be well to adopt such a system as is being worked out in Elgin County. Calcium chloride as a dust layer was used on the London and Port Stanley road with satisfactory results, using one pound and one-half per square yard.

TOWNSHIP WORK**Aldborough Township**

Statute labour was abolished in 1921. About 40 per cent. of the township roads are gravelled. During the year approximately \$18,000 was expended on township roads. There are four divisions, with a councillor looking after the work in each division.

Bayham Township

Statute labour was abolished in 1921. During the year Mr. J. G. Pauling, the road superintendent, died, and since then the reeve has been in charge of the township work. The roads in Bayham, owing to the scarcity of road material, are in poor condition.

South Dorchester Township

Statute labour was abolished in 1921. The township road work is in charge of a township road superintendent, who has a good organization. The work during the last two years has been well carried out and the ratepayers are well satisfied with the new system.

Dunwich Township

Statute labour was commuted in 1921. There are approximately 4,000 days commuted at \$1.50 per day. There is a township road superintendent in charge of the work. The roads in Dunwich are gravelled to the extent of 60 per cent. of the total.

Malahide Township

Statute labour was abolished in 1920. The road work is in charge of a township road superintendent who has built up a good organization. About 60 per cent. of the township roads are gravelled. Considerable grading has been done during the year as well as gravelling and culverts constructed.

Southwold Township

Statute labour was abolished in 1920. The reeve is in charge of the road work. About 80 per cent. of the roads are gravelled. The roads are in fair shape.

Yarmouth Township

Statute labour was abolished in 1917. The road work is in charge of a township road superintendent, who has a splendid organization. Over 90 per cent. of the roads have been gravelled. South half of this township is better off for road gravel than the north half. The township owns a motor truck loading equipment and bin and results have been highly satisfactory. The roads are in splendid condition.

KENT COUNTY

Kent County during 1922 laid 12.25 miles of concrete roadways. This was the largest mileage of concrete roads in any county in the Province under the County Road System constructed in 1922. This county has also the distinction of the largest mileage of concrete county roads in Ontario.

The Wallaceburg-Dresden road—Provincial County Road No. 115—is now completely paved with concrete 12 miles in length, 5.25 miles of which was constructed in 1922. From the westerly end of the 1921 work at N. Thamesville, 1.75 miles of concrete was built westerly to Con. 10-11 of Camden Township.

The Paincourt Road was completed during 1922, making a complete stretch of 8 miles of concrete from Paincourt to Chatham. Northerly from Chatham 1.5 miles of concrete were built on the Chatham-Wallaceburg road, within the suburban area.

In the town of Dresden a concrete roadway was laid during 1922 on St. George and North Streets from the northerly limit to the southerly limit at the Agricultural grounds, a distance of 6,239 feet. This work was done under an agreement with the county and the town.

Considerable gravelling was done in the southern portion of the county by means of motor trucks operated from the county pit at Cedar Springs. Greater care should be taken in preparation of the road grade before placing gravel on these roads.

Preliminary work has been done in the matter of the Prairie Siding bridge. This proposed bridge will span the River Thames. The bridge is to be a double-leaf bascule bridge of 159 feet centre span, with two 100-ft. spans in addition. The estimated cost of this new bridge is \$150,000.

An improvement is noticed in the method of keeping the county road accounts during the year.

Kent County has 247 miles of county roads, of which 140 miles have been surfaced to the end of 1922, or about 50 per cent. We would suggest that in the matter of maintaining the County Road System that a more adequate system of maintenance, especially on the clay roads, be carried out. Traffic conditions have changed, and it is highly essential that this maintenance work be firmly established.

TOWNSHIP WORK**Camden Township**

Statute labour was abolished in 1921. The reeve and four councillors have charge of the roadwork. Roads are chiefly clay and sand, there being little gravel. During 1922 two bridges were built.

Chatham Township

Statute labour was abolished in 1920. The bridge work in this township is good. The roads are all clay, and are well maintained. The township has approximately 235 drainage schemes.

Dover Township

Dover abolished statute labour in 1911. The roads are all clay and are in fair condition. Considerable money has been spent on drainage schemes. During the year a number of bridges were constructed.

Harwich Township

Statute labour is still retained. There are approximately 4,040 days. A number of concrete culverts have been built during the year. About 25 per cent. of the road mileage is gravelled.

Howard Township

Howard abolished statute labour in 1919. About 50 per cent. of the roads have been surfaced.

Orford Township

Statute labour is still retained. The township roads are 75 per cent. gravel surfaced. The gravelling work, outside of statute labour work during 1922, appears well done. There are 2,200 days of statute labour with 70 road divisions.

Raleigh Township

Statute labour is still retained. There are approximately 4,000 days of statute labour, with 45 divisions. During 1922 they purchased a motor truck, and approximately 8 miles of gravelling was done.

Romney Township

Statute labour is still retained, there being approximately 2,811 days with 20 road divisions. About 65 per cent. of the road mileage has been surfaced with gravel to the end of 1922. The township owns its own gravel pits.

Tilbury East Township

Statute labour was abolished in 1905. The roads are chiefly clay and consequently dragging is the chief work and has been well done.

Zone Township

Statute labour was commuted in 1921 and will probably be abolished in 1923. The roads here have been gravelled about 20 per cent. of the total mileage.

LAMBTON COUNTY

Eighteen miles of county roads were constructed in Lambton County during 1922. With the exception of 1.75 miles of concrete pavement laid in Sombra, the remaining construction was of gravel and broken stone. The concrete road built on Provincial County Road No. 5 and extending northerly from the Kent boundary line to the north limit of Concessions 6 and 7, Sombra, is the first concrete pavement laid by the county under the County System. The pavement is 18 feet in width, with a thickness of 8.25 inches at the centre and 6 inches at the sides. The subgrade was covered with gravel consolidated to a depth of three inches before placing the concrete. Two reinforced concrete culverts were built at the intersection of Concessions 6 and 7. The contract included tiling, ditching, excavation, concrete surface and shoulders.

On the county boundary, on County Road No. 7, between Kent and Lambton, 2.5 miles of macadam surface were built.

On Provincial County Road No. 81, in Bosanquet Township, 7 miles of the Pinery Road between what is known as The Cut and Grand Bend was cleared and grubbed at a cost of approximately \$1,200. The clearing was made 30 feet in width, following the old trail as nearly as possible, but eliminating the sharp turns and dangerous curves which have been a source of annoyance to users of this road for some years. Gravel is available in close proximity on either side of the new road. It is the intention of the county to put on a gravel surface and thus connect up an important portion of this lake shore road through this district. The scenic beauty of this Pinery Road has not been injured the slightest, but preparations are under way to put a first-class gravel road through that will meet the needs of the traffic, both local and tourist.

Fifteen miles of roads were graded. Four bridges were constructed and 42 culverts installed during 1922.

With regard to maintenance work there are 92 patrolmen on the Lambton County Road System. Each section averages 4 miles. Seventy-five miles of roads were resurfaced with gravel during the year.

The Lambton County Road System comprises 338 miles, of which 223 miles have been surfaced to the end of 1922 on a percentage of 60 per cent.

TOWNSHIP WORK**Bosanquet Township**

Statute labour was abolished in 1920. About 65 per cent. of the roads are gravelled. During 1922 a number of bridges and culverts have been built. Grading has been done at Lake Valley Grove. Considerable gravelling has been done during the year.

Brooke Township

Statute labour is still retained. There are approximately 4,000 days with 150 road divisions. 75 per cent. of the total mileage has been gravelled. During the year a number of bridges have been built.

Dawn Township

Statute labour is still retained. There are 4,087 days, with 118 divisions. Roads are chiefly clay. This is the first year that the Provincial subsidy has been asked for.

Enniskillen Township

Statute labour was abolished in 1921. About 60 per cent. of the total mileage has been gravelled, considerable gravelling being done during 1922. The road accounts are kept in good condition.

Euphemia Township

Statute labour was commuted during 1922. The roads are chiefly sand and clay. During the year 2 acres of gravel were bought. Roads are in poor shape.

Moore Township

Statute labour was commuted in 1918. Approximately 50 per cent. of the roads are gravelled and are in fair shape.

Plympton Township

Statute labour is still retained in this township. Seventy-five per cent. of the total mileage is gravel. A considerable number of culverts and bridges have been built during the year. All main concession roads are gravelled.

Sarnia Township

Statute labour was commuted in 1920. The road superintendent is also the clerk of the township. Considerable gravelling has been done throughout the township.

Sombra Township

Statute labour was commuted in 1919. Gravel here has to be shipped in from the St. Clair River. Clay roads predominate throughout the township. Two bridges were built during 1922.

Warwick Township

Statute labour is still retained. There are about 2,900 days and 89 road divisions. Considerable gravelling together with grading and hill-cutting was done during 1922.

MIDDLESEX COUNTY

Considerable grading has been done on the Middlesex County Road System during 1922. In all 20 miles of county roads were graded out to the full width of 24 feet. Eighteen miles of gravel roads were constructed, nine bridges were built and 62 culverts installed.

Approximately 250 miles of resurfacing has been done and classed as maintenance. The cost of loading gravel, hauling, depreciation and repairs amounted to 31.4 cents per yard mile on the year's work of motor trucks.

In the suburban area, the Pipe Line from the city limits westerly to Springbank Park was graded for a distance of 2 miles. Concrete culverts were constructed. This work is in preparation for a concrete roadway contemplated in 1923.

The new bridge over the Aux Sables River, at Brinsley, on County Road No. 48, in McGillivray Township, was started late in the season. This structure consists of two skew spans of 75 feet. The pier and abutments were completed in 1922. A new concrete floor was placed on the bridge at Muncey.

During the year 58 miles were added to the County Road System, making a total mileage of 500 miles, the largest county road mileage of any one county in the Province. At the end of 1922 season, 478 miles have been surfaced with gravel, or 95.6 per cent. of the County Road System.

TOWNSHIP WORK**Adelaide Township**

Statute labour was abolished in 1921. The reeve and councillors look after the road work. Roads are mostly all gravelled. During 1922 a 30-ft. span bridge of steel and concrete was built opposite Lot 2, Con. 3, north of Sarnia Road. Improvement could be made in repairs to culverts. The roads are in good shape.

Biddulph Township

Statute labour was abolished during 1922. Roads are principally gravel. Approximately 5 miles of gravelling was done during 1922.

Caradoc Township

Statute labour was abolished in 1920. This township is poorly off for road material, and as a consequence most of the roads are sandy. A considerable number of culverts and two bridges were built during 1922.

Delaware Township

Statute labour was abolished in 1920. Work is carried out under a township road superintendent. Two miles of new gravelling was done during 1922 and one bridge constructed.

Dorchester North Township

Statute labour is still retained. There are approximately 4,200 days with 76 road divisions. Gravelling was not done very well during 1922 but improvement noted during the latter part of the year.

Ekfrid Township

Statute labour was abolished in 1920. Fifty per cent. of the roads are gravelled. Fletcher bridge was built during 1922, of 28 ft. span, in Con. 111, South.

Lobo Township

Statute labour was abolished here in 1920. This township is well organized under a capable road superintendent. The gravel roads in Lobo Township comprise 95 per cent. of the total mileage and, with a systematic maintenance carried out, place Lobo as one of the leaders in township roads in Ontario. Two bridges of 27 ft. and 32 ft. span were built during 1922.

London Township

Statute labour is still in force, there being approximately 12,000 days. London Township is well off for gravel roads. The reeve and councillors look after the road work.

McGillivray Township

Statute labour was abolished in 1921 by a majority vote of the ratepayers. A township road superintendent was appointed in charge of all road work, and roads are well gravelled. During 1922, the Hudson bridge was constructed, of 30 ft. clear span. The roads are in fair condition.

Metcalf Township

The township abolished statute labour in 1921. During 1922 no bridge construction was undertaken. About 40 per cent. of the roads are gravelled.

Mosa Township

Statute labour is still retained. During the year gravelling was done and a number of culverts constructed. The roads in Mosa are light and sandy and considerable work, on account of the absence of road material, will have to be yet done to bring about a better condition.

West Nissouri Township

Statute labour was abolished in 1922, and considerable gravelling was done. The roads are in fair condition.

Westminster Township

Statute labour was abolished in 1919. Considerable work was done on the roads in this township during 1922. Three bridges were constructed.

Williams East Township

Statute labour was abolished in 1921. Road work is fairly well worked out and systematic maintenance is being carried out. Two bridges were constructed during 1922.

Williams West Township

Statute labour was abolished in 1920 and most of the roads have been gravelled. Work is carried out under the reeve and councillors.

Toronto, February 1st, 1923.

W. A. McLEAN, ESQ.,

Deputy Minister of Highways, Ontario.

SIR:

I have the honour to submit a summary report on the work carried out on county and township roads during the year 1922, in the counties of Carleton, Prescott and Russell, Renfrew and Stormont, Dundas and Glengarry. Most of the townships, with the exception of those in Renfrew, which are receiving Colonization Aid, availed themselves of the aid as provided for in The Ontario Highways Act. All of the townships, with the exception of two that took the above aid, have either commuted or abolished statute labour.

Steady progress has been shown in continuous construction and the creation of a policy of providing adequate foundation and drainage for permanent work.

Respectfully submitted,

C. W. CORNELL,

District Engineer of Municipal Roads.

CARLETON COUNTY

Continuing its somewhat extensive programme of the previous year, the County of Carleton, including the Suburban Area of Ottawa, had a total approved expenditure of \$704,535.39. Of the above, some \$271,941.43 was spent in the Suburban Area of Ottawa, while the remainder was distributed throughout the county. The largest undertaking in the county was the construction of 4.5 miles of waterbound macadam and 3.0 miles of bituminous penetration road

on Provincial County Road No. 89 between the Dundas County boundary and the townline of Osgoode and Gloucester. In addition to the above, some .5 miles of bituminous penetration was constructed on Provincial County Road No. 88, in the village of Carp, and .75 miles of gravelling was done on Provincial County Road No. 131 in the township of Torbolton. The Ottawa Suburban Commission surfaced 2.75 miles of the Metcalfe Road with asphaltic concrete. This road was constructed with waterbound macadam in 1921. The Commission also completed 2.0 miles of grading on the same road and constructed an 18-ft. span bridge over Saw Mill Creek.

On the County Suburban Roads, in addition to the above, some 6.50 miles of grading was completed, together with the construction of 1.83 miles of asphaltic concrete; 2.50 miles bituminous penetration, and 4.00 miles of macadam surface, along with the necessary pipe culverts, concrete culverts, and tile drainage.

The county completed, on the County Road System, 21.62 miles of grading; 15.50 miles of gravelling; 3.75 miles of macadam, and 3.87 miles of bituminous macadam.

The bridge programme in the county was comparatively small, four structures in all being completed. Two of these were reinforced concrete structures of 14-ft. spans, while the remaining two consisted of 30-ft. steel span over Steven's Creek on Road 3b in North Gower, and 60-ft. steel span over the middle branch of the Castor River on Road No. 7 in Osgoode Township.

Township Work

All of the townships in the county took advantage of the aid available under The Ontario Highways Act, and all but two townships appointed road superintendents.

Of the ten townships in the county, 4 have abolished statute labour, 5 have commuted it, and one still retains it.



PRESCOTT AND RUSSELL COUNTY ROAD
The LaFleche Bridge at Casselman, consisting of three 100-foot steel spans.

PRESCOTT AND RUSSELL

The United Counties of Prescott and Russell carried out a large programme of work during the year. Practically all of the work was done on County Roads, only a small sum being spent on maintenance of Provincial County Roads. The expenditure was in keeping with an elaborate programme previously mapped out by the counties and amounted in all to a total approved expenditure of \$564,968.62.

With the exception of 2.5 miles of bituminous macadam constructed on County Road No. 15 in the Township of East Hawkesbury, the surfacing was of waterbound macadam and gravel, of which a large mileage was completed. In all 79.24 miles was graded, 2.50 miles of bituminous macadam, 24.40 miles waterbound macadam, and 9.81 miles of gravel road were constructed.

A large bridge programme was also carried out in the United Counties during the season and for the most part took the form of steel superstructures on concrete abutments and ranged from 22.5 ft. in span to the La Fleche bridge at Casselman, a 315 ft. steel structure constructed on the piers of the old bridge which were widened and reinforced. Concrete retaining walls were constructed at the northerly end of this bridge and the road widened and straightened so that an improved condition exists at the approach to this bridge, both as to grade and alignment. Another large structure completed was the Labrosse bridge on County Road No. 27, in the township of East Hawkesbury. This consists of a 93.4 ft. steel span on concrete abutments, built at a cost of \$21,378.10.

Township Work

Of the eleven townships in the United Counties, nine took advantage of the aid available under The Ontario Highways Act. All of the above nine have appointed road superintendents and have either commuted or abolished statute labour.

RENFREW COUNTY

Renfrew County, as in the previous year, undertook quite an elaborate programme of work, the total approved expenditure being \$450,120.34. Of this expenditure, \$194,586.63 was spent on Provincial County Roads, while \$255,472.71 was spent on County Roads.

The programme on Provincial County Roads completed during the year consisted of the construction of 6.0 miles of road in Stafford and Wilberforce townships, 5.1 miles in Bromley township, 4.25 miles in Admaston township, and .75 miles just south of Renfrew, all on Provincial County Road No. 96, and consisted of waterbound macadam, 16 ft. wide, together with the necessary side culverts. The only bridge construction on Provincial County Roads consisted of one 16-ft. concrete structure opposite Lot 1, Con. VI, Wilberforce.

The county road programme was large. Gravel was used for the most part. In all, some 12.35 miles of gravel and 3.60 miles of crushed stone road was constructed. This included grading to 24 ft. wide and metal from 10 ft. to 12 ft. wide, together with the necessary culverts. Three bridges were constructed on county roads, ranging in span from 12.0 ft. to 32.9 ft. The most important of these was a 20-ft. arch structure, 57.5 ft. long, constructed on County Road No. 7 in Westmeath township. The fill over this bridge was about 14 ft.

Township Work

The township of McNab was the only township in the county that took advantage of the aid, as provided for by The Ontario Highways Act. All of the other townships in the area covered by the County Road System are receiving more or less colonization aid and are therefore not eligible for the grant under The Highways Act.

STORMONT, DUNDAS AND GLENGARRY

The United Counties of Stormont, Dundas and Glengarry modified their elaborate programme of the previous year, reducing the expenditure on the County Road System by considerably over half. Notwithstanding this large reduction, they had a total approved expenditure of \$386,183.45. Of this expenditure, \$151,876.97 was spent on Provincial County Roads and \$234,306.48 on County Roads. Twenty-two miles of grading and 19 miles of waterbound macadam were constructed on Provincial County Roads during the season, along with the necessary culverts. This was completed at a total cost of \$132,448.26. Only one bridge was constructed on Provincial County Roads; this was a 16-ft. concrete structure, 34 ft. wide, carrying a 2-ft. fill.

The County Road programme completed during the season consisted of 31.24 miles of grading and the construction of 26.41 miles of waterbound macadam, the total cost of which was \$126,560.89.

In addition to the above, a large programme of maintenance was carried out, \$93,442.85 being spent in this manner. Maintenance for the most part took the form of continuous stretches of loose stone on roads where no construction had yet been attempted and the bituminous surface treatment of roads already constructed.

Township Work

All of the townships in the United Counties, with the exception of Lochiel, took advantage of the aid available under The Ontario Highways Act, passing the expenditure by-laws, and all but Matilda and Osnabrock appointing road superintendents.

Of the twelve townships in the United Counties, two still retain statute labour. One has commuted it, one partially commuted it, and eight have abolished it entirely.

TORONTO, February 1st, 1923.

W. A. McLEAN, ESQ.,
Deputy Minister of Highways, Ontario.

SIR:

I beg to present the following report on county and township road improvement in the counties of Bruce, Huron, Oxford, Perth and Waterloo, during the year 1922.

Work progressed with substantially the same degree of activity as in 1921. There was a decrease in the total expenditure of about 17.5 per cent., which may be attributed largely to a corresponding decrease in the daily rate of wage. A further saving was due to the adoption of more modern methods of operation in many municipalities affecting both construction and maintenance disbursements.

Respectfully submitted,

H. IRWIN,
District Engineer of Municipal Roads.

BRUCE COUNTY

Provincial County Roads in Bruce County total 132 miles, 3.8 miles being macadam and the balance gravel. County Roads comprise 192.4 miles, of which 5.8 miles are macadam and 186.6 miles gravel.

During the year an interesting change of policy was brought to bear upon road expenditure generally. A previous tendency to centralize expenditures for construction of comparatively small mileages of road, at a sacrifice of funds for adequate maintenance, gave place to an endeavour to effect an improvement upon every possible mile of the system. Accordingly a programme was launched that will in a few years dispense material benefit to the whole system without enlarging upon the available funds. The result of the year's work show over 100 miles of road were ditched and graded to the standard width without disturbing the old roadbed. An equivalent mileage was lightly resurfaced, chiefly with crushed gravel. In addition there were 17.25 miles of gravel road construction and 1.75 miles of waterbound macadam construction complete; other portions of road were partially constructed. The roads connecting the towns of Hanover and Walkerton, the villages of Chesley and Tara, the villages of Tiverton and North Bruce, the villages of Hepworth and Wiarton, and the villages of Wiarton and Lion's Head, received the major part of the road construction expenditure. Gravel road construction averaged \$2,495.00 per mile completed, and waterbound macadam roads \$7,785.00 per mile completed. The county purchased six gravel pits in 1922.

The cost of engineering and supervision in 1922 amounted to 2 per cent. of the total road expenditure as compared with 3.1 per cent. in 1921 and 4.3 per cent. in 1920.

The inauguration of an adequate patrol system has placed the county in a favourable situation as regards maintenance. On Provincial County Roads, the following are average costs per mile for patrol maintenance for the 132 miles of Provincial County Road: Grading, \$12.35; dragging, \$10.33; resurfacing, \$106.30; snow shovelling, \$1.72; brushing and weed cutting, \$1.88; bridges and culverts, \$21.53. The total cost of maintenance per mile was \$154.11. On County Roads, the costs were: Grading, \$10.20; dragging, \$7.59; resurfacing, \$86.40; snow shovelling, \$1.72; brushing and weed cutting, \$1.07; bridges and culverts, \$8.84. The total cost of maintenance per mile being \$115.81.

Bridge construction included five structures, the largest being a 90-foot reinforced concrete arch truss on Provincial County Road No. 51, near Allenford. Culvert construction included 21 reinforced concrete culverts and 81 pipe or tile culverts.

The county machinery equipment was thoroughly overhauled during the year. Worn-out machinery was disposed of and a total of \$12,637.59 spent on new equipment, comprising one 15-30 horsepower tractor, one 3-ton truck, one $\frac{1}{2}$ -ton truck, one steam engine, one gas engine, one portable bin, 7 steel drags, 9 light graders, 2 road ploughs, and 43 slush scrapers.

Township Work

The total expenditure on township roads in the county of Bruce during 1922 (not including the four peninsular townships which are receiving aid under The Colonization Roads Act), amounted to \$108,803.88, an average of \$102.35 per mile on surfaced roads as compared with \$118.00 per mile in 1921. A decrease of 13.3 per cent. corresponding to an accompanying decrease of 13.6 per cent. in the cost of labour.

A 250-foot 2-span steel bridge was erected jointly by the County of Bruce and the Township of Brant at a cost of \$21,700.00. The same township constructed a 45-foot bridge with steel superstructure. The only other township to erect a bridge of considerable size was Huron, which built a 45-foot concrete truss. Culvert construction progressed satisfactorily during the year. There was a tendency on the part of several townships to let contracts at prices that could not ensure reliable workmanship or durable results, prices for concrete work, including excavation and all materials, being as low as \$4.50 and \$5.00 per cubic yard, in several isolated instances where the nature of the footings and length of haul were by no means favourable to the contractor. There were, however, many culverts erected to the standard design that compare favourably with the work of higher road organization throughout the Province, and are substantial evidence that for safety, economy, beauty and durability the standard culvert has not been surpassed for township work.

Statute labour is gradually losing its place as the foremost township road organization in the township of Huron. In 1922, 23,425 days for statute labour were performed as against 32,655 days in 1921. The cost of applying gravel by statute labour in the six townships retaining it averaged \$1.24 per yard mile as against a cost of \$0.39 per yard mile for similar work done by day labour or contract. At the close of the year two of these townships decided to abolish statute labour.

HURON COUNTY

The mileage of the Huron County Road System was increased during the year by about 6 miles, and now comprises 98.35 miles of Provincial County and 334.8 miles of County Roads, all gravel roads.

On Provincial County Roads, $5\frac{1}{4}$ miles were completely constructed with crushed gravel as a wearing surface, at an average cost of \$2,014 per mile. On County Roads an average cost of \$1,885 per mile obtained for 22 miles of gravel road construction.

Maintenance costs on Provincial County Roads averaged per mile as follows: Grading, \$18.72; dragging, \$17.35; resurfacing, \$181.80; snow shovelling, \$2.13; brushing and weed cutting, \$1.79; bridges and culverts, \$47.20; making a total per mile of \$269.00. On County Roads the corresponding figures were: Grading, \$18.00; dragging, \$9.05; resurfacing, \$95.50; snow shovelling, \$1.33; brushing and weed cutting, \$1.71; bridges and culverts, \$22.19; or a total for maintenance of \$148.10 per mile. Six gravel pits were purchased during the year.

There were 4 reinforced concrete bridges constructed on Provincial County Roads and 6 on County Roads, varying in span from 20 to 25 feet, and in clear width from 24 feet to 30 ft. Twenty-one reinforced concrete culverts were built. Concrete work averaged \$8.50 per cubic yard, steel supplied.

Machinery expenditure was light at \$2,298.87, and \$2,207.40 for new equipment and repairs respectively. New machinery comprised 1 small concrete mixer, 1 planer, 6 pick plows, 6 light graders and 42 drag scrapers. The county equipment now comprises 7 tractors, 6 crushing planes, 23 graders, 60 drags and hones, 45 scrapers and 11 pick plows.

Considerable pavement construction work was carried out during the year. In Wingham 17,064 square yards of concrete pavements were laid, at a total cost of \$71,000, including the cost of excavation, underdrainage and engineering. In Hensall, 9,920 square yards were laid, costing \$34,124 complete. Both expenditures were financed on a 10-year serial debenture basis and by agreement with the county, whereby equal annual grants of \$6,766 to Wingham and \$3,055 to Hensall will form a part of the county expenditure during the next 10 years.



HURON COUNTY ROAD

A twenty-five-foot reinforced concrete bridge in Colborne Township.

Township Work

As in 1921, all townships took advantage of the 20 per cent. Departmental subsidy under The Ontario Highways Act. The total approved expenditure on township roads (not including 31,900 days of statute labour) was \$95,397.41, averaging \$57.10 per mile over 1,671 miles, of which 83.4 per cent. are surfaced with gravel. No large bridges were undertaken by any of the townships during the year, the largest structure being 34 feet in span. Six other bridges were built, not exceeding 20 feet in span.

The cost of gravelling in the townships of Huron averaged \$0.37 per yard mile for contract and day work, and \$1.06 per yard mile by statute labour.

OXFORD COUNTY

The mileage of Provincial County and County Roads in 1922 were respectively 31.2 and 255.2 miles.

On the former, little construction work was undertaken, while on the County Roads, 28 miles of road were reconstructed, chiefly with crushed gravel. Over 22½ miles of underdrains were laid, varying in diameter from 4 inches to 18 inches.

Three bridges, 14 feet, 30 feet, and 40 feet in span, and two reinforced concrete culverts were built. A total of 46 pipe and tile culverts were also placed. The extent of maintenance

work (not on patrol system basis) on Provincial County Roads is shown in the following average costs per mile: Grading, \$8.82; dragging, \$9.38; resurfacing, \$92.40; snow shovelling, \$0.45; brushing and weed cutting, \$1.93; bridges and culverts, \$12.07. Total per mile, \$125.05. On County Roads the average costs were: Grading, \$4.13; dragging, \$5.11; resurfacing, \$104.60; snow shovelling, \$0.17; brush and weed cutting, \$2.50; bridges and culverts, \$13.45. Total per mile, \$129.96. The lack of a patrol system in Oxford is reflected in heavy annual expenditures for "reconstruction." However, at the close of 1922, a patrol system was being established and considerable economies are likely to be effected as a result.

Machinery repairs cost \$6,097.19, and \$2,816.37 was spent on new equipment, consisting chiefly of a new tractor, an elevator and conveyor, and a used crusher.

Engineering and supervision totalled \$2,807.28, being 1.9 per cent. of the total expenditure, as compared with 1.2 per cent. in 1921, 1.9 per cent. in 1920 and 2.0 per cent. in 1919.

Township Work

Township road expenditure in Oxford reached an approved total of \$140,940.68 for the 11 townships, or an average of \$136 per mile of township road. Several very creditable bridges were erected, one in Blenheim being of 158½ feet span, at a cost of about \$12,700, and another in North Oxford of 80 feet span, costing approximately \$7,200.

Of the 11 townships, statute labour prevailed in six, although two of these abolished the system at the close of the year. Under statute labour, gravelling costs averaged \$1.02 per yard mile as against an average cost of \$0.34 per yard mile for gravelling by day labour or contract.



HURON COUNTY ROAD

A gravel road between Wingham and Whitchurch on the boundary of Huron and Bruce Counties.

PERTH COUNTY

Out of a total of 241.2 miles of roads assumed by the County, 35.9 miles have been designated as Provincial County roads. For the most part the roads are gravel, there being one-half mile of concrete, 9.8 miles of stone, 3.2 miles of bituminous surface, 0.8 mile of bituminous macadam and 5.0 miles of earth roads.

On Provincial County Roads, construction work comprised ¾ mile of crushed gravel construction at Bornholm, 2,500 feet of various underdrains and one reinforced concrete bridge of 14 feet span, south of Atwood. Construction expenditure on County Roads included 4,200 feet of bituminous penetration pavement in Milverton, five small bridges with spans ranging from 10 feet to 20 feet and one 60-foot steel bridge east of Milverton station. New tile underdrains on county roads aggregated 2 5/8 miles in length, with diameters varying from 4 inches to 18 inches.

The total expenditure in 1922 amounted to \$77,008.07, including \$4,133.12 for Provincial County Road construction, and \$24,785.73 for construction on County Roads.

Maintenance work in Perth County has not received that degree of attention necessary to meet the requirements of traffic. Owing to lack of proper organization and accounting it is impossible to present enlightening cost data as regards the activities under this heading. Computed on a mileage basis, however, an average of \$148.00 was spent on each mile of Provincial

County Roads and \$170.00 per mile on County roads. While these figures are substantially in accord with those relating to maintenance costs in other counties, they must not be considered to indicate any organized attempt at adequate maintenance. The roads themselves are indisputable evidence that the above expenditures per mile have not been applied by methods that are universally considered as economical. Wearing material, scarce and consequently expensive, is in most instances improperly placed and utilized to poor advantage. Supervision by the daily appointed authority is very inadequate and the system of administration fails, year after year, in rendering an account of road performance that might merit the unqualified approval of those who use and pay for the roads concerned.

Township Work

On a total township road mileage of 1,070, there was a gross expenditure in 1922 of \$125,406.57, an average of approximately \$117.00 per mile. Unfortunately the amount includes a total unapproved expenditure of \$13,823.37, comprising chiefly the misapplication, in several townships, of statute labour that had been returned as commuted. It does not include the monetary value of 14,660 statute labour days in the 5 townships that had adhered to the old system. Seven bridges were built during the year, including one of 40 feet span in Downie and a larger structure 56 feet long in Mornington. The cost of gravelling township roads in Perth County during 1922 averaged \$0.38 per yard mile by contract and \$1.09 per yard mile by statute labour.

WATERLOO COUNTY

At the close of 1922 there were in Waterloo County 43.3 miles of Provincial County and 154.6 miles of County Roads, a total of 17 miles of the former having been designated during the year. The system now comprises 10.75 miles of concrete, 2.0 miles of stone, 0.7 miles of bituminous macadam and 184.5 miles of gravel.

Concrete road construction totalled 3.2 miles, widths varying from 16 to 20 feet, and at prices ranging from \$1.86 to \$2.23 per square yard. This work included 1 7/8 miles of pavement south of Elmira and 0.5 miles on the Galt-Hespeler road. Smaller stretches of pavement were laid in the villages of Linwood, Hawkesville, West Montrose, Bridgeport and north of the town of Waterloo. In addition, King Street, a connecting link on Provincial County Road No. 75, in the town of Waterloo, was paved under agreement with the County, thus connecting up the towns of Waterloo and Elmira with concrete.

Two new bridges were erected on Provincial County Road No. 109, near the villages of Wellesley and Phillipsburg, of 30 feet and 100 feet spans respectively. Other important items of construction included the preparation for concrete pavement by ditching, grading and culverts of 1 1/2 miles between St. Clements and Heidelberg; the reflooding of the 218-foot bridge at Bridgeport with creosoted wood block; 1,200 feet of bituminous macadam pavement, 24 feet wide, on County Road No. 37, and 1 1/2 miles of gravel road construction on County Road No. 5.

Concrete culvert construction included 6 reinforced concrete culverts of standard design and 16 corrugated pipe culverts.

Maintenance work averaged \$193.00 per mile for Provincial County and \$268.00 per mile for County roads, with labour at 30 cents per hour for men and 60 cents for teams. A considerable mileage of old road was scarified and rerolled. A noteworthy feature of Waterloo County's road activities during 1922 was the adoption of a County road system and the establishment of a complete system of patrols to undertake the task of maintenance. These steps had been matters of debate for several years.

The total expenditure on the County road system in 1922 amounted to \$182,531.65, of which \$7,346.94 was expended on the Provincial County roads and \$91,862.20 on County roads. Engineering and supervision cost \$3,430.37, or \$1.88 per cent. of the whole road expenditure.

Township Work

In 1922, the five townships expended a total of \$47,056.46, or \$80.00 per mile, exclusive of 9,000 days of statute labour. Contract and day labour work averaged \$0.39 per yard mile or the application of gravel and \$1.26 per yard mile for the gravelling performed by statute labour.

TORONTO, March 14th, 1923.

J. A. McLEAN, ESQ.,
Deputy Minister of Highways, Ontario.

SIR:

I herewith beg to submit an annual report on work carried out on the county and township roads in the Counties of Dufferin, Grey, Halton, Simcoe and Wellington, during the year 1922.

Yours truly,

H. A. LUMSDEN,

District Engineer of Municipal Roads.

DUFFERIN COUNTY

Dufferin County made great strides toward the goal of efficiency in County road matters when they changed from a township system to a purely county one in November, 1921. The results are already most noticeable, showing the great disadvantages under which the officials worked while following the old system.

Out of a total of 9,626 miles within its boundaries, Dufferin has 25.6 miles of Provincial Highway, 1 mile stoned and the remainder gravelled; 48.6 miles of Provincial County Roads, 10 miles earth and 38.6 miles gravelled; 150.1 miles of county roads, 2.8 miles stoned, 866 miles of gravelled and 60.7 earth, and 738.3 miles of township road, of which 167.5 miles are gravelled.

The amount spent on road construction on Provincial County roads amounted to \$15,866.65. The principal work carried out was 1.7 miles of grading, of which 1.0 mile was surfaced with crushed gravel on road No. 134, at a cost of about \$3,500.00 per mile. Another work deserving mention was the grading and graveling of Con. 1, W.H.S., of Mono Township, on the Heckley road, at a cost of \$3,984.06. Hill cutting opposite Con. IX, Amaranth, and filling of a sink-hole opposite Con. V and VI, Amaranth, greatly benefited the Arthur road. This was done at a cost of \$3,967.38.

Bridge construction on Provincial County Roads consisted of one 10-foot span by 20 feet clear roadway on Provincial County Road No. 120, at a cost of \$1,325.85.

Maintenance and repair on Provincial County roads cost \$11,981.81, consisting mainly of resurfacing. The large amount of resurfacing clearly indicates the lack of immediate repairs and systematic dragging.

On County road construction the most important item is the grading and graveling of 2.4 miles on road No. 19 south of Shelburne, at a cost of \$9,504.93. Construction totalled \$39,196.96.

Three bridges of 10 foot span were built on the County roads at a total cost of \$3,600.00.

Township Work

The townships built several bridges, the most notable being the Haws bridge in East Garafraxa, which consists of two 80-foot arched truss spans, built at a cost of \$12,600; the Turner bridge in East Luther, of one 100-foot arched truss and span; and one 50-foot bridge in Amaranth. The rest of the work consisted of a small amount of grading and considerable graveling.

The six townships in Dufferin, all of which participated in the subsidy provided by The Ontario Highways Act, spent an approved total of \$69,263.05, which is a cost per mile of \$94.00.

GREY COUNTY

Grey has a total of 2,537.8 miles of roads. Of this, 2,062.7 miles are township roads, 323.5 miles are county roads, 72.8 miles are provincial county roads, and 78.8 miles are included in the system of Provincial Highways. There are 180.5 miles of stone and 1,522.8 miles of gravel roads in the County. The remainder are earth, with the exception of 1.3 in the township of Derby, which is cement concrete.



GREY COUNTY SUBURBAN ROAD

Nine-foot concrete pavement and two ten-foot gravel shoulders, constructed by the Owen Sound Suburban Roads Commission.

Construction on Provincial County roads totalled \$122,880.74, of which \$36,017.56 was spent on Owen Sound suburban roads. The most notable item of this construction was a 9-foot concrete slab with 4½ feet of macadam on either side, built in the township of Derby, in the suburban area of Owen Sound. The 3,930 lineal feet cost \$27,418.47. Other features were the construction of 5½ miles of gravel road in the township of Bonnick, on Provincial County Road No. 65, at a cost of \$24,533.08, and the construction of 4 miles of gravel surface on Provincial County Road No. 14, in the township of St. Vincent, at a cost of \$21,284.52.

County road construction cost \$33,397.44, of which \$18,006.46 was the cost of 3 miles of consolidated gravel road, graded and metalled, on Road No. 29 in the township of Artemesia, and \$11,680.04 was the cost of 1½ miles gravelled road on the townline of Artemesia and Glenelg, on Road No. 27. Bridge construction on county roads totalled \$9,300.76.

Maintenance and repair on county roads, including suburban county roads, cost \$58,767.10. Resurfacing accounted for \$46,851.71 of this amount. Machinery purchased by the county to the amount of \$2,642.99 included 3 Ford trucks, 17 road drags and 3 small graders.

Township Work

A total of \$122,331.31 was approved for road work in the 15 townships of this County, all participating in the Departmental subsidy. Several of the townships do not tackle their road problems in an energetic manner. Permanent work is in some cases entirely neglected. Patch work and temporary repairs appear to be the rule. In most of the townships, however, an effort toward permanent improvement is made, and in some cases excellent results were obtained.

HALTON COUNTY

The total mileage of roads in Halton County is made up as follows:—

	Concrete	Stone	Gravel	Earth	Total
Provincial Highway.....	14.4	12.1	9.0	6.1	41.6
Provincial County Roads.....	4.1	31.9	6.0	3.0	45.0
County Roads.....	3.0	74.2	15.6	7.2	100.0
Township Roads.....	....	21.5	32.8	372.8	427.1
Totals.....	21.5	139.7	63.4	389.1	613.7

Provincial County Road construction exclusive of bridges amounted to \$8,071.50, the principal item of which was the construction with a macadam surface on ½ mile of Provincial County Road No. 132 in Nelson Township, at a cost of \$4,900.05.

Bridge construction on Provincial County Roads amounted to \$3,294.79. Of this amount the Coulton bridge, of 20 ft. span, and 20 ft. clear roadway, cost \$2,381.69.

Maintenance of Provincial County roads amounted to \$8,611.94, 93 per cent. of which was for resurfacing.

A total of \$84,390.81 was spent on County road construction. A stretch of concrete 18 feet wide and 1,092 feet long was built south from the village of Bronte to the lake front, and continued north to the Grand Trunk tracks, a distance of 7,235 feet, with a 10 foot slab and 3 feet macadam shoulders. The total cost was \$32,810.32. The remainder of the construction consisted of 16½ miles graded and surfaced with crushed stone. Maintenance and repair cost \$12,721.04, the principal item being \$10,783.34 for resurfacing.

One new road roller was purchased at a cost of \$5,272.18.

Township Work

Approved expenditure in the four townships totalled \$117,215.07. All four townships participated in the Departmental subsidy. Some very excellent work was done in several of these townships and an improvement is noted over previous years' work.

SIMCOE COUNTY

In this county, with a total of 2,479.1 miles of all classes of road, the County road system includes 118.2 miles of Provincial County roads and 355.6 miles of County roads. There are in addition 1,952.2 miles of township roads in the 16 townships concerned. Eight of these townships, however, are receiving colonization aid. The township roads are for the most part earth, there being 661.7 miles of gravel and 3.0 miles of stone surface.

The County and Provincial County roads are chiefly gravel and stone, with a total of 89.4 miles of earth surface.

Construction on Provincial County roads amounted to \$35,967.96. The only outstanding piece of work was the grading and gravelling of approximately five miles of the County boundary between the counties of Simcoe and Grey, south of the village of Singhampton. This was accomplished at a total cost of \$16,158.21, or at a rate of approximately \$5,000.00 per mile. This is a very excellent piece of work. Bridge construction on Provincial County roads cost \$1,624.11, being for the Barker's bridge, of 16 foot span, on Provincial County Road No. 20.

Maintenance on Provincial County roads amounted to \$30,587.47, resurfacing of \$25,438.22 being the principal item. Grants to towns and villages on account of Provincial County roads amounted to \$11,847.93.

County road construction was not extensively carried out, only \$14,779.19 being spent on this work, mostly in small, isolated patches. Grants to towns and villages chargeable to County road construction totalled \$17,939.54. Six bridges built on the County roads cost \$23,092.99, the most important being a 60-foot concrete girder bridge in Con. 11, Township of Tiny, on Road No. 21, at \$9,269.23, and the Maynard bridge in Con. 12, Tecumseth, on Road No. 116, at \$6,704.69.

Maintenance and repair cost \$53,328.18, \$43,516.26 of which was charged to resurfacing. Machinery purchased consisted of 5 drags, 4 one-team graders and 1 wheel scraper, at a total cost of \$1,195.62.

Township Work

The eight townships which did not receive any Colonization Aid all participated in the Departmental subsidy. The total approved expenditure was \$89,729.03, about 25 per cent. of which was applied to the building of permanent structures, grading and other permanent work. This shows a very favourable trend to township road work in this County.

WELLINGTON COUNTY

Wellington has a total of 86.0 miles of Provincial Highway, 64.6 miles of Provincial County Road, 282.8 miles of County Road, and 1,349.6 miles of Township Roads. According to types the following figures apply:

Concrete.....	6.5 miles
Bituminous surface.....	6.0 "
Stone.....	14.7 "
Gravel.....	966.8 "
Earth.....	789.0 "
Total.....	1,783.0 "

Construction on Provincial County roads amounted to \$1,972.96, and on bridges to \$5,884.80. The latter amount was spent on the Bosworth breakwater and retaining wall on Provincial County Road No. 68.

Maintenance on Provincial County roads apart from Suburban roads cost \$28,875.32, and on Suburban Provincial County roads \$1,913.15, which averaged \$477.00 per mile; of this amount \$18,645.12 was charged to resurfacing, or an average of \$288.00 per mile. This large average for resurfacing should show a great decrease in future on account of an efficient patrol system having been inaugurated.

Construction on County roads in 1922 cost \$11,250.02. There was no outstanding construction work carried out, but rather the proper grading and metalling short stretches which were in the worst condition.

Bridge construction, however, was carried on intensively, no less than 17 bridges of 10-foot span or over being built, at a total cost of \$53,533.25, the most outstanding bridges being the Belwoods bridge of one 150-ft. steel truss span, costing \$26,788.23, the Arthur Street bridge in Harriston, of one 50-ft. concrete girder span, and the Red bridge in Drayton, of one 80-ft. concrete truss span. The last two bridges cost \$9,232.73 and \$8,137.02 respectively. Maintenance on County roads of \$79,171.17 and on Suburban County roads of \$4,891.11 was mainly made up of resurfacing, which cost a total of \$47,654.46, or an average of \$168.00 per mile.

Machinery costing \$5,862.17 was added to the plant, including a crusher, 2 loaders and 48 road drags.

TORONTO, February 1st, 1923.

W. A. McLEAN, ESQ.,
Deputy Minister of Highways, Ontario.

SIR:

I have the honour to submit the following summary report on the work carried out under The Highway Improvement Act and The Ontario Highways Act during the year 1922. The district comprises the counties of Ontario, Prince Edward, Victoria, Durham and Northumberland and Peterboro.

Construction work in its many phases is a basic industry the same as agriculture. Its fundamental purpose is to protect the public. Tearing down to build again must be avoided. It is the creator of permanent wealth. When it is at a maximum, prosperity is at a maximum, and when it is limited, prosperity is limited. What is true of construction generally is true of road construction in particular.

In constructing standard roads the municipality is creating a permanent wealth that will pay rich dividends now and in the future, in the way of safety to the public, pleasure and cheapened transportation.

Considerable work of a permanent nature was undertaken during the year throughout the counties. This comprised the purchase of right of way, hill cutting, grading, the surfacing of a considerable mileage with gravel, macadam or some of the higher types of road surface, and the building of culverts and bridges.

A further lowering in wages is to be noted during the past summer. In consequence, the supply was not as plentiful as might be desired. The counties, however, that paid the highest wages were able to command an ample supply of labour.

A steady elimination of wastes is to be noted. This has been brought about largely through co-operation and improved organization. Conferences of the road foremen were held in two of the counties, so a better understanding and a common action might be brought about in handling the work. Another notable feature is the benefit these foremen derive from the collection, compilation and interpretation of Construction and Maintenance statistics furnished by the Superintendent. This enables each foreman to compare his results with that of his neighbour. A wholesome emulation is thus brought about which is reflected in the character of the work done.

Respectfully submitted,

JOHN MCVICAR,

District Engineer of Municipal Roads.

ONTARIO COUNTY

The high standard attained by this County in past years was fully maintained and in some respects improved upon during the past season.

Hill cutting was carried out at two places. A hill in Brock Township was reduced from a 12 per cent. grade to 8 per cent., and another in Uxbridge was reduced from 9 per cent. to 5 per cent., at a cost of less than \$4,600 for the two. In order to provide for the future supply of gravel on the county roads, two gravel pits were purchased during the summer. They contain about $4\frac{1}{2}$ acres of gravel and cost a little over \$1,800.

The main essential of road building is good drainage. In the county of Ontario in 1922 there were 14 miles of Provincial County roads graded and ditched to standard and 7.5 miles of County road. An Avery Kerosene Tractor was used for this purpose, together with a No. 8 grader with a tractor hitch. A marked increase in the efficiency of a grader outfit such as the above is to be noted where there are no telephone or power poles to interfere. During the season there was expended by the County on construction work about \$70,000. Somewhat over one-third of this amount was spent upon bridges and culverts.

Eight bridges were built, one with span of 18 feet, and the remainder with 12-foot spans, at a cost of about \$15,000. Thirty-one culverts were built at a cost of about \$15,000, the size varying from 2 ft. by 3 ft. to 4 ft. by 6 ft. Galvanized iron pipe was used in 26 places, the size varying from 15 inches up to 24 inches, one 36-inch pipe being used. Seventy-four farm entrances were provided on the road system.

About \$39,500 was expended upon the maintenance of the County roads. The patrol system is employed. After providing for the dragging and patching of the roads, about 4.5 miles were resurfaced on the Provincial County roads and 10 miles on the County roads. This was where the grading and ditching had already been done.

A new Avery tractor was purchased in 1922. It is a special 18-36 horsepower road machine. The cost of moving earth with this outfit averages about 10 cents per cubic yard. Five one-team graders were also purchased.

Township Work

The townships in the County of Ontario are making the best effort to meet the regulations in the whole district. Five or six of the townships, like Pickering, Thorah, Brock, Scott, Reach and W. Whitby, are making favourable progress in their road building programmes. Each built a bridge or two and from one to four culverts, all of standard design and of splendid workmanship. In addition, some section of road was graded and gravelled, making a very creditable showing. All the townships in the County did the usual amount of resurfacing.

PRINCE EDWARD COUNTY

The work carried out in the County in 1922 was in some respects the most satisfactory yet undertaken by the County. Attention was given to all phases of road construction. The snow nuisance was overcome as far as possible by the widening of the right-of-way and the clearing away of rubbish and old crooked rail fences. No doubt a marked cheapening in the cost of grading would also result from this widening. Previously long hauls of material were undertaken on the narrow right of way when material lay alongside the grade after the widening was done. On Provincial County Road No. 24 in the townships of Hillier and Ameliasburg, $3\frac{1}{4}$ miles of road was graded to standard width and macadamized at a cost of \$16,602. The stone for surfacing was quarried from a pit in the vicinity, crushed by the county crusher and hauled to the road, spread and rolled.

Maintenance on other Provincial County roads cost \$8,846. This for the most part consisted of oil treatment.

The road construction consists of $3\frac{3}{4}$ miles of waterbound macadam in the township of North Marysburg, at a cost of \$11,758. Two and five-eighths miles of the same type of road in the township of Hallowell at a cost of \$7,590, and in South Marysburg $1\frac{1}{2}$ miles for \$5,033. On the County roads a reinforced concrete bridge was constructed at Gilbert Mills at a cost of \$2,215.

The expenditure upon the maintenance of the County roads amounted to \$16,448. Three items accounted for a large portion of this, one on road No. 1 of \$2,316, another on road No. 6 of \$2,094, and a third on road No. 13 of \$4,963.

No new machinery was bought this year of the larger units. \$1,074 were expended on small equipment, the largest item being \$205 for a pump.

Township Work

In this County only three townships so far have availed themselves of the Provincial grant. In these townships no work of importance was undertaken. They all did some resurfacing with gravel, but none of it could be highly commended. There is a great lack of road machinery to meet the needs of the present day traffic in these townships. Dragging was done as far as drags were available, but it requires a drag for every 8 or 10 miles of road. Splendid service can be obtained from the one team graders, but one grader cannot overtake the amount of work necessary in the townships.



VICTORIA COUNTY ROAD

A new grade and gravel surface through a swamp south of Lindsay.

VICTORIA COUNTY

During the past season the work done in this County was of the same general excellence as has characterized it in the past.

In eleven cases land was purchased in order to improve the alignment of the road at sharp and dangerous curves. Approximately \$600 was expended on this very necessary improvement.

At two widely separated points on the system, hill cutting was carried out. The Ops-Fenelon hill near Lindsay was reduced from about 12 per cent. grade in solid rock to 7 per cent. at a cost of a little over \$8,000. Crawford's hill at Omeme was reduced from a 16 per cent. to a 7 per cent. at a cost of about \$11,000. The volume of material excavated here was about 12,000 cubic yards.

Grading to standard widths in advance of all surfacing was adopted as a general policy during the season. Tractor and grader outfits have been employed for this work as well as slip scrapers.

Asphaltic concrete pavements were laid on a part of the connecting links in Lindsay and Fenelon Falls. In the latter 5,470 feet and in the former 3,924 feet were laid, at costs of \$46,000 and \$31,000 respectively. Bituminous macadam was built with imported stone in Little Britain. Twenty-four hundred and ten feet were laid at a cost of \$10,490.

Base course macadam was laid during the season on $5\frac{1}{4}$ miles of road. Crushed stone consolidated by traffic was laid on $2\frac{1}{4}$ miles. Nearly 17,000 gallons of light tar was used to treat the macadam roads at a cost of $24\frac{1}{4}$ cents per gallon applied. Over \$50,000 was expended on the work of macadam construction and surface treatment.

Gravel roads were built at a number of widely separated places. Both pit run and crushed gravel were used. Something over five and one-half miles were built.

Two reinforced concrete bridges of the culvert type were constructed. Twelve box culverts standard reinforced concrete, 116 galvanized pipe culverts, 15 township road crossings and 99 farm crossings were built. Tile drains for the different works totalled over 24,500 feet to provide drainage.

The chief items of machinery bought were a Case tractor, a Chevrolet car, pile driver, 6 dump wagons, and 10 wheel scrapers. Other small units brought the total outlay up to \$8,707.

Township Work

The work on the township roads was for the most part resurfacing. Some grading was done in all the townships and an effort made to meet the regulations both as to width of grade and as to drainage. It is as yet difficult to get the township officials to spread the gravel. They still want to pile a foot or more of gravel on old gravel roads where 3 or 4 inches would be sufficient. Only one township in the County in working under a superintendent.

DURHAM AND NORTHUMBERLAND

Gravel road is the type built in these counties. On the Provincial County roads, 7 miles of grading was done and 4.4 miles of it gravelled. A notable piece of construction work was undertaken in the Counties this year, in the building of a road across Porter's Swamp in the township of Manvers to connect up with Victoria County. This section of road runs about 6 miles due south from the town of Lindsay. Victoria County built about two miles on the same road, a northerly extension of the Porter's Swamp. This construction was undertaken to avoid what is known locally as Sullivan's hill, where the grade is about 20 per cent. The total expenditure on Provincial County roads is about \$20,000. The expenditure for maintenance of Provincial County roads averaged \$206 per mile.

Special grants made to the towns and villages in the Counties amounted to about \$16,000. In these municipalities the expenditures are not well made. They have amounts to expend upon very limited mileages out of all proportion to that available for the County roads. Yet upon the whole the class of work done in most of them is somewhat disappointing. This can only be accounted for by the fact they lack proper supervision. An improvement in this respect should be looked for in the near future. Upon the maintenance of the Provincial County roads about \$20,000 was expended. Of this amount about \$11,000 was taken up in resurfacing road No. 38, \$1,500 on road No. 39, \$2,400 on road No. 57, and \$1,000 on No. 58.

The construction upon County roads comprised grading of 2.75 miles and graveling 7.25 miles. The expenditure amounted to about \$6,000. Upon the maintenance of County roads nearly \$37,000 was expended. Of this amount road No. 10 was resurfaced at a cost of \$1,500; road No. 18 at \$2,100, and road No. 25 at \$4,000. The maintenance expenditure averaged \$143 per mile.

In addition to the above, 79 pipe and tile culverts were laid and 5 reinforced concrete culverts. The additions to the equipment were 16 split log drags and 7 dump wagons, which were bought second-hand. An old truck was traded in on a new one costing \$5,180.

Township Work

Darlington is perhaps the banner township in the United Counties in the manner of attacking her road problems. Last year the construction programme embraced 3 bridges and 14 culverts, all of reinforced concrete. A number of steel pipes were also laid and necessary dragging and resurfacing carried out. Townships like Cavan and Seymour also are doing good work. In Cavan a bridge and two reinforced concrete culverts were built. In Seymour about a half mile of road was constructed as well as a hill cut down. Cramahe does some splendid work in road construction, both as to grading and graveling. The other townships did resurfacing for the most part.

PETERBORO COUNTY

The construction work carried out in this County is confined almost wholly to the suburban area, where splendid work is being done.

On Provincial County suburban area, about \$5,000 was expended on half a mile of road, which included two reinforced concrete culverts. Nearly \$5,000 was expended on the maintenance of the Provincial County roads, of which \$1,380 was spent on grading road No. 100 and \$2,600 in resurfacing it.

On County Suburban roads, \$5,000 was spent on the construction of road No. 3, and \$4,300 on road No. 17, chiefly for culverts.

Nearly \$19,000 was spent on the maintenance of County roads. This is an expenditure of about \$8.0 per mile on the whole of the County roads. In addition to the above about \$7,700 was expended on the maintenance of County Suburban roads. Fifty-two pipe and tile culverts

were laid, as well as 9 reinforced concrete culverts built. A number of small pieces were added to the machinery list during the summer, the largest item being 10 one-team graders, 6 for the county and 4 for the suburban roads.

Township Work

The southern townships in the County are working under The Ontario Highways Act. The township of Otonabee is doing some very good work both as to construction and maintenance. One reinforced concrete culvert was constructed and a number of steel pipes were placed in the roads. The gradient carried out was of a splendid class, as was also the resurfacing. In the other townships resurfacing comprised the greatest amount of their work. It is highly desirable that they make a more serious effort to give better drainage to their roads before embarking so heavily on gravelling.

TORONTO, February 1st, 1923.

W. A. McLEAN, Esq.,
Deputy Minister of Highways, Ontario.

DEAR SIR:

I have the honour to submit a summary report on the work carried out on County roads and Township roads during the year 1922, in District No. 7, according to the provisions of The Highway Improvement Act and The Ontario Highways Act. This district includes the Counties of Hastings, Lennox and Addington, Frontenac, Leeds and Grenville, and Lanark.

In addition to the regular inspection, special visits were made at the request of the officials in different municipalities. The assistance provided by this Department is appreciated.

It is gratifying to report that the methods for carrying on the work and the results obtained are improving. This is particularly noticeable in construction work. More attention is also being given to maintenance, which, as yet, is not systematic enough in many instances to give the best results.

Labour conditions were fairly well back to normal again and help seemed plentiful, except during the harvest season.

Thirty-two townships in this district availed themselves of the aid as provided by The Ontario Highways Act.

Respectfully yours,

J. M. MACINNES,
District Engineer of Municipal Roads

LANARK COUNTY

The Lanark County Road System embraces some 212 miles of road, of which 37 miles are Provincial County Roads and 175 miles are County Roads.

Work on Provincial County Road No. 83, known as the Perth to Lanark road, was continued northerly from Balderson to near the crossing of the Mississippi River, a distance of 2.5 miles. The average cost per mile was \$17,166.00, which includes the widening of the right of way to 66 feet, the placing of 12 tile culverts, the building of 6 reinforced concrete culverts, grading and constructing a heavy base of field stone, with a bituminous macadam surface 16 feet wide. The construction of this road is being done very thoroughly, and when constructed the maintenance is given careful attention. On Provincial County Road No. 82, known as the Perth to Rideau Ferry road, the work done consisted in widening with field stone a part of the road that passes through a swamp. In all some \$43,207.68 was expended on construction and some \$8,844.84 on maintenance of Provincial County Roads.

On the County Roads approximately 16 miles were well constructed, of which 3 miles were surfaced with gravel, 11 miles with crushed stone, and 2 miles with bituminous macadam. The latter, which is the outstanding feature of the work, is located north of Carleton Place on road No. 28. Some of the grading, the stone base and the laying of tile culverts on this particular piece of work was carried out the previous season. The roadway was made 28 feet wide, and very well graded. Also a reinforced concrete bridge of 10-foot span and 26-foot clear roadway was constructed. Maintenance and repair work consisted mostly in shaping with a grader, and surfacing with crushed stone. In all some \$48,768.14 was expended in the construction and \$34,409.68 in the maintenance of county roads.

Township Work

The township work consisted mostly in maintaining by surfacing with crushed stone. Eight townships in this county availed themselves of the grant as provided by The Ontario Highway Act, seven of these appointing superintendents. In all about \$19,600.00 was expended on the township roads.

HASTINGS COUNTY

On Provincial County Roads, some \$37,404.46 was expended on construction. This amount covers the grading of 7.6 miles, 4 of which were surfaced with crushed stone and 3.6 miles with gravel, the placing of 25 pipe culverts and the building of two bridges, one a concrete and steel of 55 feet span, the other a reinforced concrete of 18 feet span. On maintenance the amount of \$22,885.14 was expended. Surfacing with crushed stone, or gravel, and the widening of narrow roadways accounted for most of this expenditure. The connecting links through the villages of Marmora and Madoc were given surface treatment of oil.

On the construction of County roads, the sum of \$21,670.36 was expended. This amount includes the grading and surfacing with gravel of 8.25 miles, the placing of 54 tile culverts, the building of one 5 ft. by 5 ft. reinforced concrete culvert, and the building of three reinforced concrete bridges, two of these having a span of 18 feet and the other a span of 11 feet. The sum of \$28,923.57 was expended on County Road maintenance, surfacing with crushed stone or gravel accounting for the most of this amount. The section of road north of Cannifton that was constructed during the previous season received another treatment of oil.

On Provincial County and County Roads, more care was given to the dragging of gravel surfaces, and of crushed stone surfaces that had not been rolled.

One stone crusher and bin, one oil distributor and fourteen drags were added to the County outfit.

Township Work

Four townships availed themselves of the grant as provided by The Ontario Highways Act. Each township has a road superintendent. In all, \$30,739.00 was expended. This was chiefly on surfacing with crushed stone or gravel. The township of Sidney built 10 reinforced concrete culverts, and one concrete and steel bridge of 20 feet span.

LENNOX AND ADDINGTON

On the construction of Provincial County roads the amount of \$35,333.00 was expended. On road No. 25 three miles were ditched. A narrow rock cut was widened and the grade reduced, the material from the cut being used to widen and raise the fill, and also for finishing with a waterbound macadam surface. Four pipe culverts were placed. Road No. 35 having a narrow right-of-way, was surveyed, and where constructed the fences were moved back to give the required 66 feet. The road for 2.6 miles was graded, of which 1.6 miles was finished with waterbound macadam and one mile with gravel. Twenty-nine pipe culverts were placed. On road No. 54 about 2 miles were graded and finished with waterbound macadam. Five pipe culverts were placed. The sum of \$10,266.58 was expended on maintenance, the most of this being surfacing with crushed stone or gravel. Badly rutted roads either on Provincial County or County roads were scarified, shaped with a grader and rolled.

The sum of \$9,178.23 was expended on County Road construction. This amount covers the ditching and grading of 4 miles, the surfacing of one mile with waterbound macadam, the placing of 26 pipe culverts and also the making of a heavy rock fill on either side of the Floating Bay bridge. A new bridge is to replace the old one in the near future. One reinforced concrete bridge of 18-foot span was built on the Hastings boundary. Maintenance to the amount of \$23,122.08 was carried out, this mostly being resurfacing with gravel or crushed stone. Two road drags, one sprinkling tank, one 12-ton roller with scarifier, and one steam drill were added to the outfit.

Township Work

The work on township roads consisted mostly in surfacing with crushed stone or gravel. Four of the townships in this county availed themselves of the grant as provided by The Ontario Highways Act. Each township appointed a superintendent. In all, \$27,455.67 was expended. The township of Camden East added a stone crusher and two spreader wagons to their road building outfit.

FRONTENAC COUNTY

The County Road System comprises 53 miles of Provincial County roads and 152.5 miles of County roads, of which 10.5 miles and 30.5 miles are respectively Kingston suburban roads. In the construction and maintenance of Provincial County roads the sum of \$15,192.56 was expended. Construction included rock cutting, the placing of seven tile culverts, building a concrete and steel bridge of 20 foot span and filling the approaches with stone, and building two reinforced concrete bridges, one a 16-foot span and the other a 22-foot span. Maintenance consisted mostly in resurfacing with crushed limestone. On road No. 137, 1.5 miles were surfaced with oil and covered with sand.

The sum of \$37,761.82 was expended on County Road construction. This included the grading of 16 miles, of which 15 miles were surfaced with waterbound macadam, the material used being crushed limestone, the widening of $\frac{1}{4}$ mile of fill with stone and placing a guard rail on either side, the placing of 34 tile culverts and the building of two reinforced concrete culverts. On maintenance work \$20,632.99 was expended, resurfacing with crushed stone or gravel accounting for the most of this expenditure.



TOWN OF WATERLOO

Twenty-foot concrete pavement on North King Street, which is connecting link of Waterloo Provincial County Road.

Township Work

Four townships in this county availed themselves of The Ontario Highways Act. Each of these appointed a road superintendent. In all, some \$22,185.00 was expended. The most of this expenditure being for surfacing with crushed stone or gravel.

LEEDS AND GRENVILLE

On Provincial County roads no heavy construction work was undertaken. The work consisted in finishing the Lombardy to Rideau Ferry road; the improving by grading and surfacing with crushed stone of a sharp turn, and the building of one reinforced concrete culvert. Maintenance was mostly resurfacing with crushed stone. In all, \$25,128.00 was expended.

On County Road construction \$60,586.00 was expended. This amount includes the grading of 8.8 miles, the surfacing of 13.5 miles with crushed stone, most of which was rolled, the surfacing of 2.4 miles with gravel, the placing of 19 tile culverts, the building of 6 reinforced concrete culverts, and the building of 3 bridges. Two of these are reinforced concrete with 14-ft. and 16-ft. spans; the other is concrete and steel, with 22-ft. span. On the maintenance of County roads the sum of \$45,760.00 was expended, chiefly on resurfacing with crushed stone or gravel.

On Provincial County and County roads, rough surfaces were repaired by scarifying, shaping with a grader and then rolling.

Township Work

Eleven townships in this county availed themselves of the grant as provided by The Ontario Highways Act, nine of these appointing road superintendents. The sum of \$65,252.00 was expended on township roads; the most of this was for resurfacing with crushed stone or gravel.

TORONTO, February 1st, 1923.

W. A. McLEAN, Esq.,

Deputy Minister of Highways, Ontario.

SIR:

I have the honour to submit a summary report of the road improvement carried out under The Highway Improvement Act and The Ontario Highways Act during 1922 in the counties of Brant, Haldimand, Lincoln, Norfolk, Welland, and Wentworth.

The total expenditure in the six counties, exclusive of money expended on township roads and on Provincial Highways was \$1,915,319.59, being slightly less than the amount expended during 1921. Most of the standard types of road construction were represented in the season's programme, namely: gravel, waterbound macadam, bituminous macadam, asphaltic concrete and cement concrete.

The most noticeable improvement to the work in general in the district was in the standard of grading. In practically every instance where a new grade was put up the standards required by the Department were fulfilled. This, I think, is due in no small degree to the object lesson gleaned from observation of the splendid grades on the Provincial Highways throughout the district.

The same improvement is noticeable in the work being performed by the townships, the majority of which, with the exception of those in Norfolk and Brant counties, have township superintendents in charge of their road improvement.

Respectfully submitted,

J. H. HAWES,

District Engineer of Municipal Roads.

BRANT COUNTY

The construction programme in Brant County during the season of 1922 was for the most part a continuation of the work begun the preceding year. The chief item of expenditure was the construction of two and one-half miles of concrete pavement, nine feet in width, on the Burford road, continuing from where the work stopped last year to the limit of the suburban portion of this road. This nine-foot strip was built on the north side of the road and a gravel road of similar width alongside provided an eighteen-foot roadway. This arrangement has been found to work very satisfactorily here, the concrete carrying practically all the motor traffic, so that the gravel has to take care of only the turn-out traffic and consequently incurs a very low maintenance charge. On the Cockshutt road considerable heavy grading was done and four fills totalling approximately 34,000 cubic yards of earth were made to replace old wooden trestles. This work was done by day labour at a cost of thirty-seven cents per cubic yard. The greater part of this road is graded to Provincial County standard and additional right of way has been acquired throughout where necessary.

On Provincial County Road No. 50, two miles of standard grade and ditch were constructed, and surfaced with crushed gravel. On County roads six miles of standard grade was put up and surfaced with gravel. An eighteen-foot concrete slab was laid on the County road known as the Ava road, leading northwesterly from Brantford city limits for a distance of 0.8 mile.

The bulk of the expenditure for maintenance was for gravel, resurfacing and dragging. It is the policy in this County to give all their gravel roads a light resurfacing with fine gravel each year so as to keep a floating surface of fine material. This keeps the road in such a condition that it can be dragged when necessary. Something over thirty miles of this gravel maintenance was carried out and three miles of bituminous surface treatment was put on in the vicinity of St. George on Road No. 50. About five miles of oiling was done in various places throughout the county.

Three bridges were constructed during the season, the spans being 12 feet, 14 and 88 feet. The two former are of the same design as the department's standard reinforced concrete culvert, while the latter is a steel truss on concrete abutments, over Kenny Creek on the Burford Road. A temporary plank floor was laid on this bridge, as it was considered too late in the season to put on the concrete deck after the steel was put in place.

The total expenditure for the year was \$216,979.16, of which approximately \$80,000.00 was spent on the Brantford Suburban roads. County Road No. 6, otherwise known as the Galt road, leading north from the city of Brantford, was designated a Provincial County road in 1922.

Township Work

All of the townships in Brant County availed themselves of the Provincial subsidy on their season's work. The township of Brantford had an expenditure of over \$28,000 exclusive of their statute labour. The township of Oakland is the only one which has entirely abolished statute labour. The township work on the whole was very satisfactory during 1922, consisting chiefly of the construction of concrete culverts, grading and gravelling. The combined expenditure of the five townships was approximately \$54,000.00.

HALDIMAND COUNTY

The outstanding feature of the work in Haldimand this year was the practical completion of the grading and drainage of the entire County Road system, only about eight miles of the more recently designated portions remaining to be graded. A total of 8.5 miles of grade was built on the road from Blackheath south to the Provincial Highway at an average cost of \$1,950.00 per mile, exclusive of culverts.

On the County Roads, 31.5 miles of road grade were built in various places throughout the system. The grading of these roads is a decided improvement to the system, especially to those portions having no metalled surface, since it makes it possible to properly drag and maintain them.

This county at present has a large mileage of waterbound macadam road which is in need of resurfacing. It is proposed to experiment with gravel for this purpose. A film of about two

inches of gravel has been spread on some portions and if it proves successful it is proposed to convert a large part of the present macadam roads into gravel surfaced roads and maintain them as such. At the latest observation this method appeared to be working out quite satisfactorily. 10.25 miles of new waterbound macadam, 12 feet in width, were built and 4.25 miles of gravel road.

Special grants aggregating \$13,416.28 were made to the villages of Hagersville, Caledonia and Cayuga, for the improvement of connecting links on the County road system through these villages. 3,071.36 square yards of concrete pavement were laid in the village of Cayuga, on Cayuga and Norton Streets, connecting County Road No. 17 with the Provincial Highway.

The only bridge work of importance was the construction of a 50-ft. reinforced concrete arch with 20-ft. roadway over MacKenzie Creek, on the road leading south from Caledonia village.

Of a total expenditure of \$161,661.26, \$15,125.54 was spent on maintenance and \$7,380.67 on machinery. The maintenance consisted chiefly of dragging on the earth roads and some resurfacing on the macadam roads. The only new machinery of any consequence purchased was a rock crusher.

Township Work

A marked improvement was noted in the work carried out in the different townships. The grading is of a much higher standard than heretofore, chiefly owing to the lessons learned from observations of the grading operations, on the County and Provincial Highway system. Also with regard to their culverts, the old, narrow wooden structures are being replaced by reinforced concrete of approved design as rapidly as finances will allow. The work in the majority of the townships is under the direction of a permanent township superintendent.



TORONTO-PORT HOPE PROVINCIAL HIGHWAY
Asphaltic concrete pavement twenty feet wide in Pickering Township.

LINCOLN COUNTY

Lincoln County this year had one of the largest programmes in road construction in its history, most of the standard types being represented in the season's work, namely: concrete, bituminous macadam, macadam surface treated, waterbound macadam and gravel. Practically all the construction work was done under contract. The maintenance was looked after by a well organized system of patrolmen. Each patrolman had a beat of from three to five miles, for which he was responsible in the matter of dragging or patching the road. For the maintenance of the bituminous macadam roads, of which there is now approximately twenty-eight miles, a small gang with a light truck and the necessary equipment was steadily at work.

The construction programme consisted of over twenty miles of 24-ft. grade, 19 miles of waterbound macadam varying from 10 to 18 feet in width according to the importance of the road, 5½ miles of bituminous macadam and two miles of gravel.

Since Lincoln County came into the good roads scheme in 1904, the system has grown to approximately 180 miles, including the Lincoln and St. Catharines Suburban roads. Out of this 180 miles the following has been constructed to date: Concrete, 4.75 miles; asphalt, 0.5 miles; bituminous macadam, 28.5 miles; waterbound macadam, 65.0 miles; gravel, 16.5 miles. This leaves approximately 65 miles of earth roads still to be surfaced, but of this a large portion has been properly graded and drained and is being maintained as earth roads. During the summer season these are kept in good condition with the drag.

The work on the Suburban roads for the past season consisted chiefly of maintenance, the only construction work of importance being one-quarter mile of concrete pavement with a nine-foot macadam road alongside on the Martindale hill. The Lincoln and St. Catharines Suburban Roads Commission since its inauguration has done very creditable work. Of the 12.2 miles of road under their jurisdiction, 9 miles have been constructed, of which 4.75 are of concrete.

Township Work

The township work in this county is above the general average. The townships have all abolished statute labour years ago and their work, with the exception of the township of Niagara, is in charge of township superintendents. A large proportion of the roads in the townships adjoining the lake have been gravelled with lake gravel, while surfacing on roads above the escarpment consisted of macadam.

The township of North Grimsby made an interesting experiment during the season for the purpose of collecting lake gravel. A concrete pier was built out into the lake for a distance of about 75 feet and when last visited seemed to be accomplishing its purpose quite thoroughly. A gravel beach had been built up in the course of a few weeks extending out possibly fifty feet from the original shore line at the pier and tapering off to nothing about 800 feet east along the shore. Thus it served the double purpose of protecting the shore line which was washing away rapidly at this point and of storing up a supply of good gravel.

NORFOLK COUNTY

The largest single piece of construction in Norfolk County during the season was on Provincial County Road No. 29, leading north from Simcoe. Slightly over two miles was graded 28 feet wide, with an 18-foot bituminous macadam top, at an average cost of approximately \$19,000. Two small concrete bridges of 10-foot span were also built on this road to replace the existing wooden structures. This completes a continuous stretch of about eight miles of bituminous macadam leading from Port Dover through the town of Simcoe.

Four and one-half miles of bituminous macadam were also completed on roads eight and nine in the vicinity of Port Rowan.

On roads sixteen and seventeen, in the vicinity of Teeterville, in the Township of Windham, 2½ miles of crushed gravel surface, 16 feet in width, were completed.

The above types of road, namely, bituminous macadam and gravel, are the only ones being built in this county. There is at present a considerable mileage of splendid gravel road in the county.

Considerable winter gravelling was done on several of the roads by way of maintenance. As a rule this work is not nearly as satisfactory as when done during the summer season, but labour being much cheaper during the winter months, the county feels justified in adopting this method of resurfacing some of the roads of lesser importance. By the judicious use of the drag and small grader as early as practicable in the spring, these roads can be brought into good condition. In the western portion of the county it is impracticable to undertake any considerable amount of grading before the time of putting on gravel or other surfacing material owing to the sandy nature of the soil. The natural grade will not keep its shape for any length of time.

Township Work

The township of Townsend abolished statute labour in 1921, and during the past two seasons has put up about 60 miles of grade of a fair standard for township grading. In 1922, they dispensed with the services of the superintendent of the previous year, and left the work under the supervision of the various councillors. A fair amount of work was accomplished, though not as satisfactory as under the supervision of one superintendent. The township of Woodhouse has commuted statute labour and is doing fair work, though they have not yet learned the lesson of spreading their gravel sufficiently.

The remaining townships still cling to statute labour and for the most part are still employing the antiquated methods of road making which are characteristic of that system.

WELLAND COUNTY

Welland led the counties in this district with a total expenditure of \$568,191.23 for the season, \$483,483.98 being expended on construction and \$84,707.25 on maintenance.

The total mileage of the county system is at present about 171 miles, of which 115 miles are county roads, and 46 miles provincial county roads. Thirteen miles of additional Provincial County road were designated during the year, consisting of what is known as the Creek Road, leading from Becket's Bridge across the Welland River to the western boundary of the County, and the road leading from Thorold southerly to the Provincial Highway.

Approximately ten miles of bituminous macadam, 16 feet in width, were constructed, eight miles of which were within the Welland and Niagara Falls Suburban Areas, and two miles on the Garrison Road west of the road leading to Ridgeway and Crystal Beach. This is a continuation of the bituminous macadam road leading west from Fort Erie, which was built in 1920 and 1921. About 5¼ miles of waterbound macadam, 16 feet in width, were constructed on the new Provincial County road leading west from Becket's Bridge and 1¼ miles westward from Fenwick to the

county boundary. Approximately 15 miles of waterbound macadam 9 feet in width was constructed on the County roads at various places throughout the system. In the neighbourhood of 40 miles of new grade was put up including the grading in connection with the various contracts.

No new bridge construction was undertaken, but the bridge over the Little Forks creek on the Creek road was extended to conform to Provincial County standards.

The entire programme of construction was carried out under contract, the county equipment being engaged in maintenance work throughout the county. The average cost per mile for 9 foot waterbound macadam was \$8,500.00, the price for bituminous macadam ranged from \$15,750 per mile to \$16,200 per mile. In addition to the above, 1.5 miles of gravel road was constructed in the township of Pelham, the gravel being purchased from the township.

The maintenance work consisted chiefly of resurfacing of macadam roads with two inch crushed stone. The road from Crystal Beach to the Garrison Road and Provincial County Road No. 69 from Port Colborne to Marshville, were given a bituminous surface treatment. When last inspected the surface treatment from Port Colborne to Marshville appeared to be quite satisfactory, but that on the road leading to Crystal Beach was disintegrating under the heavy traffic between Buffalo and Crystal Beach. This, during the summer months, reached a maximum of 5,000 vehicles per day on Sunday.

Many of the county roads suffered severely during the season from detour traffic during the construction of Provincial Highways in their vicinity, especially those in the townships of Thorold and Stamford.

Township Work

With the exception of the township of Willoughby, which still operates under the statute labour system, every township in the county is in receipt of the 20 per cent. subsidy from the Province on their road work. Their work in every case is under the direction of a township superintendent, and in general is very satisfactory. With the exception of the township of Pelham and those bordering on Lake Erie, no gravel is available. The remaining townships have to depend on quarried stone for their surfacing material, which makes the work more costly. On account of the construction on the Provincial Highway in the townships of Thorold and Stamford, heavy truck traffic was detoured over the township roads. This made work of a permanent nature practically impossible in these townships.

WENTWORTH COUNTY

The total expenditure in Wentworth for 1922, including the expenditure of the Wentworth and Hamilton Suburban Roads Commission, was \$282,343.98. This exceeds by about \$30,000.00 the 1921 expenditure.

The ratio of expenditure on construction as compared with maintenance, during the past season was much higher than heretofore, and more permanent work was accomplished than in any preceding year. The more important items of construction consisted of the laying of one and five-eighths miles of concrete pavement ten feet wide, with three foot bituminous macadam shoulders on Provincial County road No. 105, leading north from Binbrook village. One and one-quarter miles of similar pavement was constructed by the Suburban Roads Commission leading south from the City of Hamilton on the same road. The bridge known as Woodburn Bridge, immediately south of the village of Woodburn, was completed during the season, the south abutment having been previously built. This is a reinforced concrete structure with a span of forty-five feet and a clear width of roadway of twenty-four feet, and is a very creditable piece of work. Two large culverts were built, one with a span of fourteen feet and twenty-eight feet in length, between lots 10 and 11, in Concession 4, township of Barton; the other a ten-foot span and the same length between lots 24 and 25, concession 2, in the township of Saltfleet. This with a few exceptions practically cleans up the bridge and culvert work in Wentworth, and the structures built to date are a credit to the county. Waterbound macadam roads constructed on various parts of the system totalled thirteen and one-half miles, and gravel one and one-half miles.

By way of maintenance, \$39,885.84 was spent on the repair of existing macadam roads, and \$4,691.55 on bituminous surface treatment of macadam roads. Thirty-five tile culverts were installed throughout the system and seven concrete box culverts were constructed.

Township Work

All the townships with the exception of Beverley have either commuted or abolished statute labour, and most of them are doing good work, especially the townships of East Flamboro, Barton, and Saltfleet. East Flamboro township now has a gravel or macadam surface on nearly all the roads in the southern three-quarters of the township. Saltfleet has the same on all the roads below the mountain. Barton township still has a large mileage of clay roads, but laid a considerable amount of macadam on roads adjoining the city of Hamilton.

REPORT OF PROVINCIAL HIGHWAY FORESTER

W. A. McLEAN, ESQ.,
Deputy Minister of Highways, Ontario.

TORONTO, February 1st, 1923.

SIR:

I submit herewith a report of the principal operations undertaken by the Highway Forestry Branch during the years 1921 and 1922, and also a report on the control of advertising devices such as signboards along the Provincial Highways which work is very closely associated with the work of reforestation and beautifying the Highways.

Respectfully submitted,

H. J. MOORE,
Provincial Highway Forester.

The practice of planting trees along the Provincial Highways was continued during the year 1921. 15,000 shade trees were planted on approximately 112 miles of road. The number of trees planted during the spring and fall seasons was about equal.

In addition to the above, 2,500 seedling Scotch pines were planted on the slopes at the westerly end of the cut at the Rouge 15 miles east of Toronto, on the Kingston Road. On the slopes of the cut at the easterly side of the bridge, small trees and shrubs were planted, these latter being obtained from the bush lands adjacent.

PLANS AND ADVICE

The Highway Forestry Department received a large number of requests for plans to enable residents on the Provincial Highways, and organizations to beautify the surroundings of homes, or to improve areas in which they were interested. A considerable number of requests for advice as to choice of trees and shrubs for planting were also received. Whenever plans were required to beautify areas such as home frontages, surroundings of schools, cemeteries or park areas which touched the Provincial Highways, these were prepared and furnished gratis to those who made the request. In all 30 plans were prepared comprising departmental 8, municipal 5, schools and college grounds 6, private grounds 4, cemeteries and memorials 3.

The giving of plans to make possible the beautification of areas adjacent to the Highways of Ontario is to be commended for two reasons, (a) homes with beautiful surroundings generally will have an influence for good in the lives of children who occupy them, and who will be the citizens of to-morrow; (b) beautified areas and home surroundings along the Highways not only speak eloquently of prosperity and of happiness, but are a source of attraction to tourists and others who use the roads. By preparing these plans the Department has started a real movement for better and brighter home surroundings, the influence of which will be felt more and more as the years go by.

LECTURES

During the spring of 1921, the Highway Forester addressed forty-five meetings, chiefly in the evenings, in the interests of the Department and of the Department of Agriculture on such subjects as Beautification of Roads, Laying Out of Home Grounds, and Planting Herbaceous Perennial Borders. In addition to these, five lectures were given on tree pruning to officials and men of the Bell Telephone Company and the Ontario Hydro-Electric Power Commission at Toronto, Oshawa, London, Chatham and Windsor. These lectures were illustrated by lantern slides and were well attended. Requests were received by the Department to hold similar meetings in Eastern Ontario, during 1922, from the Ontario Hydro-Electric Power Commission and the Bell Telephone Company, the centres chosen being Belleville, Kingston and Ottawa. A request was also received from Montreal; this was acceded to as a large number of the Bell Telephone Company's men operate out of Montreal along the Ottawa-Point Fortune Highway, and between Kingston and Lancaster, these being Highways of the Province of Ontario.

By holding meetings of the forementioned character, a large number of men are instructed in the proper methods of tree pruning and it is really astonishing to note the change in the way in which individually the men apply themselves to their work. The influence of this instruction is not only confined to tree pruning along the Highways, but has spread to urban and other municipalities where greater care is taken, and better methods applied when the men employed by the Bell Telephone Company and the Ontario Hydro-Electric Commission have trees to prune.

At least the officials of the forementioned utilities have tried to work in active and earnest co-operation with the Department of Public Highways. They have urged common-sense methods while trimming the trees which interfered with their services, so that little if any mutilation of these has occurred along the Highways.

INJURY TO ROADSIDE TREES

On account of some little injury to newly planted trees caused by animals which were allowed to stray along the Highways, several offending owners were warned. In some cases they seemed to think that there was no law to prevent this trespass; happily, however, they soon became convinced otherwise and of the seriousness of the act of allowing horses and cattle to stray. Apart from the act of trespass and of injury to trees, there is also the possibility of injury to motorists and others, to say nothing of the possible loss of the animals through colliding with motor vehicles.

Injury to trees, especially to the mature ones, along the Provincial Highways, was also caused during 1921, as in other years, by caterpillars of various sorts. Such injury is bound to accrue as long as owners of trees everywhere are apathetic to the damage. The attacks of the caterpillars of the tussock moth are too well-known to need mention herein. In some towns and cities, steps have been taken to control it, but in the country practically none.

What is true of the tussock moth is true of the Handmaid moth (*Datana Integerrima*) the ugly black caterpillars of which are slowly but surely draining the life blood of our beautiful black walnuts everywhere. It has been said that while this caterpillar is a destroyer of the beauty of the trees, as it attacks and devours the leaves too late in the season (August) to do much harm, and does not really destroy the life of the tree.

The observation of the writer is that the continued attacks year by year on the same trees, even as late as August, can have but one result, namely to weaken and to ultimately kill the trees. In fact, hundreds of dead or dying trees testify to the havoc wrought by the caterpillars, the injury being directly traceable to this cause.

DEPARTMENTAL AND OTHER PARKS

In continuing the policy of the Department in cleaning up and beautifying the areas at road intersections, that at the intersection of the Kingston Road and Burnham Street, at Cobourg was seeded and was prepared to receive shrubs. From midsummer onward the well-kept grassy area presented a very pleasing effect, and in direct contrast to what had previously pertained at this point.

The small park area at Welcome corner, near Port Hope, which was laid out during 1920, was maintained in large measure voluntarily by residents of the locality and to their credit be it said that the neatly kept area with its green lawns and plantations of flowering shrubs was greatly admired by motorists, many of whom stopped to comment on its appearance.

During the year the Department co-operated with the residents and council of Stamford Township to clean up and to beautify as far as possible the area known as "Stamford Green." The council donated a sum of \$500 to carry out the work. A plan was prepared by the Department, and arrangements made to plant the area at the southerly point of the green, at the intersection of the St. Davids-Niagara Falls Provincial Highway and the Stamford-Queenston Road. This area will be completed during the year 1922.

The planting of trees was continued along the Provincial Highways during 1922. 15,500 trees were planted in alignment or were grouped, along the Highway. Approximately ninety miles of road were planted during 1922.



PORT HOPE-BELLEVILLE PROVINCIAL HIGHWAY

Scenic section of the road showing the trees trimmed to admit sun and air, permitting the snow to melt, and the road to dry quickly in the spring.

INSTRUCTION IN TREE PRUNING

With a view to instructing the employees of the Bell and other telephone companies, and of the Ontario Hydro Electric Commission in tree pruning, meetings were held at Kingston and Ottawa. Both were well attended. This was effected in continuation of a policy established during 1921, when five meetings were held. The value of this instruction will be more fully realized when it is stated that not only do these men prune the trees along the Provincial Highways, but also along practically all roads and in all municipalities in the Province. In the work also there is a moral. The men more intimately understand the Forester, and he more intimately understands them, thus a feeling of co-operation and of friendship is created, and out of this respect is created by both parties, for each other and for the interests they represent.

REFORESTING SLOPES

In the spring of 1922, 2,500 three-year-old Scotch pines were planted with the three-fold purpose of holding the slopes upon which planted, to beautify the areas and to produce lumber of commercial quality in the future. The pines were planted about five or six feet apart in large groups, which spacing will allow of later thinning out of the trees for the sake of beauty, or of a natural system of reforestation if desired. The areas planted were the south side of the Rouge cut east of Toronto, and the slopes at Springer Hill near St. Thomas.

For similar reforestation projects an application was made to the Ontario Forestry Department for 30,000 seedling trees of various kinds to be planted during 1923, on the slopes of cuts and fills, or on otherwise waste areas along the Highways. Included in this consignment will be Scotch Pines, Hard Maples, Red Oaks, and Black Walnuts.

PARKS AND WASTE AREAS

The designing and laying out of various park areas was undertaken during 1922. The area at the intersection of Main Street, Hamilton, and the Stoney Creek road was graded to receive the soldiers' memorial which is to be built by popular subscription, and to allow of trees and shrubs with which it is intended to effect beautification. The people responsible for the erection of the memorial are to be complimented, for beautiful as it is in design and of an imposing height, it will be seen from all directions, and will prove a source of great attraction to residents and tourists alike. The grading and planting of the easterly approach to St. Catharines, embracing two strips of land, 1,800 feet in length along the new pavement, was effected during the fall. The Provincial Highway at this point separates the older portion of the Victoria Lawn Cemetery from the new cemetery. The planted portion thus is not only an approach to the city, but also to the beautiful cemetery. Were it not for the co-operation of the cemetery board, and especial of Mr. Cameron, the Superintendent, who undertook the planting, the work could not have been accomplished during 1922.

INFORMATION TO PROPERTY HOLDERS

Enquiries too numerous to specify, relative to home beautification, reached the Forester's Department during the year 1922; these chiefly from residents whose property touched the Highway, but also from many others. In some cases plans were prepared to enable those who enquired to lay out their grounds.

Perhaps the greatest number of enquiries were about phases of tree planting and pruning. These were answered as fully as information at command would allow. In view of these enquiries which showed the need of information in some concise form, a pamphlet, "The Planting and Care of Roadside Trees," was prepared. This is well illustrated and is now available to all who apply for same to the Department of Public Highways.

ROAD WIDENING MEETINGS

In order to present the advantages of road widening along the Provincial Highways to owners of property along these, road widening meetings were held during 1922 at Cooksville, Erindale and Aldershot, along the Dundas Road Provincial Highway; at Woodslee, Thamesville, Wardsville and Melbourne, on the Longwoods Road; and at Lambeth, on the London-St. Thomas Provincial Highway.

Sometimes a little opposition was experienced to the policy of widening the Highways to a width of 86 feet. However, in fairness to the property owners, it should be said that once the advantages have been explained and are understood and the conditions of purchase elucidated, the opposition is generally withdrawn. In some cases those who had previously opposed it now lead the movement to widen the Highways.

INJURY TO TREES

A little injury to new trees planted along the Provincial Highways occurred during 1921 through trespass of cattle. In a few cases trees were broken off at the top of the stake by cows which illegally were allowed to browse on the planting strip. The owners of the animals were warned of the consequences of further trespass with the result that the practice was stopped.

Considerable injury was again inflicted on the black walnut trees along the Hamilton-Queenston Provincial Highway and on lands adjoining same by the caterpillars of the Handmaiden Moth (*Datana integerrima*). These caterpillars, year by year during the months of August and September, defoliate the trees, thus reducing their vitality. Frequently during a mild autumn the buds which are formed to produce next year's leaves appear soon after the original leaves are eaten, with the result that the frost kills them, and few, if any, remain for next year's growth. The young caterpillars of the Handmaiden Moth prey largely upon the hickories and defoliate these and also many other species.

It is supposed that owing to the lateness of the attack, August and September, that little damage is done. This is erroneous, and the continued attacks are slowly but surely killing the trees. Next year it will be necessary for this Department to take effective steps by collecting the caterpillars or by spraying the trees to eradicate the pest.

INTEREST SHOWN IN THE WORK

Perhaps the most pleasing feature in connection with the work of planting trees along the highways was the interest displayed by residents and organizations in the work.

Municipal organizations in many cases extended offers to co-operate in the work of planting trees and in the beautifying of the approaches to their respective towns and cities or of waste areas adjacent thereto, within reasonable limits of expenditure.

The Chamber of Commerce and the Town Council of Bowmanville are interested in the laying out of two small parks, to be maintained by the municipality, and for which plans have been prepared.

The Cemetery Board at St. Catharines have materially assisted in the laying out and in beautifying the easterly approach to the city and to the Victoria Lawn Cemetery, which work is now practically completed and is to be maintained by the cemetery board.

The Kiwanis Club of Guelph offered to pay one-half the cost of planting an avenue of trees one mile long on the Hamilton-Guelph Highway; unfortunately the land necessary to widen the right of way had not been obtained at that point at the time of the offer. Perhaps, however, the offer will be extended.

The Chamber of Commerce of Hamilton, through Mr. John A. Webber, the chairman of the Beautification Committee, have requested permission to supply one thousand trees to be planted as a memorial avenue, the Department to plant the trees. This will extend from the easterly limits of the City of Hamilton along the new Main Street Provincial Highway to the point of intersection of the said highway and the Stoney Creek Road. The Township of Saltfleet, or at least a committee appointed by such, consisting largely of members from Winona and Stoney Creek, under the chairmanship of Senator E. D. Smith, started the work of building a beautiful granite memorial on the area at the intersection mentioned in the last paragraph. This imposing monument is at the termination of the proposed memorial avenue from Hamilton eastward, and it is fitting that a dignified memorial avenue of trees should lead to a dignified structure. The combination will be a very happy one if the work is effected as proposed.

Year by year greater interest is being shown in tree planting and in cleaning up and beautifying waste areas as far as is within reason. Not only so, but as shown in this report, material help is being afforded the Department by some of the best and most influential people and organizations.

It would not be fair to omit from mention Horticultural and other societies which are under the superintendence of Mr. J. Lockie Wilson, which, though their funds are not large, have extended their financial as well as their moral support to effect the beautification of the Highways which run through their municipalities.

Certain it is that partly through the aid of individuals and organizations, the Highways in the Province of Ontario are going to take on a different appearance, especially at the approaches to the municipalities, and at no great cost to the Department.

CONTROL OF SIGNBOARDS

The control of signboards and other advertising devices along the Provincial Highways of Ontario, during the year 1922, was as far as possible effected. The first act of this Department was to order the removal of all signs on the right of way such as are generally found nailed to fences and to trees. Failure of the owners of these signs to comply with the requests was followed by their removal by the Department. In all some 2,000 small signs were removed. In some cases signs were replaced by others which were fastened to the fence wire by means of steel wire and pliers, almost as soon as the Resident Engineers had removed the previous ones. These were also removed, although at some trouble.

During the year, considerable work was entailed in checking up the existing signboards along the Provincial Highways. Some little difficulty presented itself but was largely overcome. The owners of the signs and the sites had to be located, and each in turn had to be notified of the necessity of complying with the Regulations. A large number of signboards were removed. The owners of these in some cases could not be found, and in others did not care to license the boards.

The method of control had first to be planned, as being an innovation careful steps had to be taken. The plan decided upon was to issue order to the Resident Engineers to prevent any new signs being erected unless a license had been obtained. The matter then resolved itself into the control of existing signs. In some cases it was found that leases for a number of years existed and that considerable money had been spent in leasing the sites and in painting and erecting the signboards. Generally, it was found that the owners desired to comply with the regulations, although it must be admitted that recourse may have to be made to legal proceedings in one or two cases.

The total number of signs licensed during the year 1922 was 56, comprising 17 along the Toronto and Hamilton Highway and 39 along Provincial Highways. The signs were of various sizes, twenty being 50 feet in length, thirty-four 10 feet in length, and two being less than 10 feet long. The total amount received in license fees was three hundred and seventy-two dollars (\$372.00), distributed as follows: Toronto and Hamilton Highway, \$170.00; Provincial Highways, \$202.00.

REPORT OF REGISTRAR OF MOTOR VEHICLES

W. A. McLEAN, ESQ.,

Deputy Minister of Public Highways, Ontario.

TORONTO, February 1st, 1923.

SIR:

I beg to submit herewith the annual report of the Motor Vehicles Branch for the year 1922.

This report shows in detail: The motor vehicle registrations for the calendar year 1922, arranged according to the residence and occupation of owners, the model, horsepower, and number of cylinders of passenger cars, the model and carrying capacity of commercial vehicles, the carrying capacity of trailers, and the residence of chauffeurs, dealers and garages. A summary of the convictions registered under The Motor Vehicles Act and reported to the Branch during the calendar year 1922.

In connection with the convictions reported under The Motor Vehicles Act, I might say that while the greater number of the Magistrates throughout the Province are forwarding their reports, as required by the Act, there are apparently some Magistrates who do not make reports and consequently our records are not as complete as they might be were all the Magistrates co-operating in this regard.

Respectfully submitted,

J. P. BICKELL,

Registrar of Motor Vehicles.

PASSENGER CARS REGISTERED, 1922

Counties		Cities		Total
Algoma.....	990	Sault Ste. Marie.....	1,105	2,095
Brant.....	1,663	Brantford.....	1,779	3,442
Bruce.....	3,670	.....	.....	3,670
Carleton.....	2,030	Ottawa.....	5,045	7,075
Dufferin.....	1,669	.....	.....	1,669
Dundas.....	1,498	.....	.....	1,498
Durham.....	1,735	.....	.....	1,735
Elgin.....	3,338	St. Thomas.....	1,345	4,683
Essex.....	7,238	Windsor.....	3,786	11,024
Frontenac.....	1,317	Kingston.....	1,250	2,567
Glengarry.....	872	.....	.....	872
Grenville.....	1,066	.....	.....	1,066
Grey.....	3,629	Owen Sound.....	888	4,517
Haldimand.....	2,706	.....	.....	2,706
Haliburton.....	172	.....	.....	172
Halton.....	2,420	.....	.....	2,420
Hastings.....	3,477	Belleville.....	945	4,422
Huron.....	4,385	.....	.....	4,385
Kenora.....	137	.....	.....	137
Kent.....	5,897	Chatham.....	1,486	7,383
Lambton.....	3,965	Sarnia.....	1,258	5,223
Lanark.....	1,887	.....	.....	1,887
Leeds.....	2,559	.....	.....	2,559
Lennox and Addington.....	1,579	.....	.....	1,579
Lincoln.....	2,186	St. Catharines.....	1,402	3,588
Manitoulin.....	638	.....	.....	638
Middlesex.....	4,900	London.....	4,742	9,642
Muskoka.....	793	.....	.....	793
Nipissing.....	1,340	.....	.....	1,340
Norfolk.....	2,595	.....	.....	2,595
Northumberland.....	2,679	.....	.....	2,679
Ontario.....	3,581	.....	.....	3,581
Oxford.....	4,194	Woodstock.....	796	4,990
Parry Sound.....	820	.....	.....	820
Peel.....	2,313	.....	.....	2,313
Perth.....	3,209	Stratford.....	1,169	4,378
Peterboro.....	1,760	Peterboro.....	1,306	3,066
Prescott.....	972	.....	.....	972
Prince Edward.....	1,700	.....	.....	1,700
Rainy River.....	569	.....	.....	569
Renfrew.....	2,227	.....	.....	2,227
Russell.....	625	.....	.....	625
Simcoe.....	5,820	.....	.....	5,820
Stormont.....	1,571	.....	.....	1,571
Sudbury.....	1,281	.....	.....	1,281
Thunder Bay.....	388	Fort William.....	899	.....
.....	.....	Port Arthur.....	746	2,033
Temiskaming.....	937	.....	.....	937
Victoria.....	2,304	.....	.....	2,304
Waterloo.....	3,541	Galt.....	849	.....
.....	.....	Kitchener.....	1,777	6,167
Welland.....	3,323	Niagara Falls.....	1,516	.....
.....	.....	Welland.....	959	5,798
Wellington.....	3,144	Guelph.....	1,145	4,289
Wentworth.....	2,775	Hamilton.....	7,989	10,764
York.....	6,538	Toronto.....	37,204	43,742
Foreign.....	325	.....	.....	325
	128,347		81,386	210,333

PASSENGER CARS REGISTERED, 1922, ACCORDING TO OCCUPATIONS
OF OWNERS

Farmers.....	68,049
Merchants.....	17,834
Tradesmen.....	31,027
Professional.....	8,092
Manufacturers.....	5,058
Doctors.....	3,863
Livery and Garages.....	5,929
Commercial Travellers.....	3,614
Firms.....	2,882
Real Estate Agents.....	1,240
Cartage Agents.....	623
Insurance Agents.....	1,323
Agents.....	6,496
Contractors.....	3,708
Undertakers.....	431
Clerks.....	9,327
Labourers.....	6,675
Managers.....	10,083
Police.....	572
Drovers.....	572
Soldiers.....	213
Unoccupied.....	16,435
Unclassified.....	5,616
Municipal Corporations.....	138
Public Utilities.....	109
Banks.....	41
Railways.....	15
Dominion Government.....	108
Ontario Government.....	256
Hospitals.....	4
	<hr/>
	210,333

PASSENGER CARS REGISTERED, 1922

Horse Power

22.5.....	101,003
15.....	137
16-20.....	28,277
21-25.....	53,706
26-30.....	22,248
31-35.....	2,590
36-40.....	1,736
41-45.....	356
46-50.....	158
51 up.....	15
Electric.....	107
	<hr/>
	210,333

Motive Power

Gasoline.....	210,221
Electric.....	107
Steam.....	5
	<hr/>
	210,333

Registrations

Originals.....	30,749
Renewals.....	179,584
	<hr/>
	210,333

Models

Touring cars.....	170,528
Runabouts.....	13,945
Sedans.....	14,850
Coupes.....	10,874
Taxicabs.....	136
Buses.....	.....
	<hr/>
	210,333

Cylinders

Less than 4 cylinders.....	8	
4 cylinders.....	184,674	
6 cylinders.....	23,639	
8 cylinders.....	1,714	
12 cylinders.....	191	
Electric.....	107	
		210,333

COMMERCIAL CARS REGISTERED, 1922

Counties		Cities		Total
Algoma.....	72	Sault Ste. Marie.....	150	222
Brant.....	99	Brantford.....	324	423
Bruce.....	145	.....	.....	145
Carleton.....	123	Ottawa.....	996	1,119
Dufferin.....	61	.....	.....	61
Dundas.....	56	.....	.....	56
Durham.....	96	.....	.....	96
Elgin.....	116	St. Thomas.....	51	167
Essex.....	749	Windsor.....	711	1,460
Frontenac.....	69	Kingston.....	148	217
Glengarry.....	29	.....	.....	29
Grenville.....	72	.....	.....	72
Grey.....	117	Owen Sound.....	87	204
Haldimand.....	143	.....	.....	143
Haliburton.....	7	.....	.....	7
Halton.....	302	.....	.....	302
Hastings.....	164	Belleville.....	136	300
Huron.....	184	.....	.....	184
Kenora.....	36	.....	.....	36
Kent.....	246	Chatham.....	247	493
Lambton.....	184	Sarnia.....	143	327
Lanark.....	78	.....	.....	78
Leeds.....	192	.....	.....	192
Lennox and Addington.....	89	.....	.....	89
Lincoln.....	366	St. Catharines.....	344	710
Manitoulin.....	13	.....	.....	13
Middlesex.....	267	London.....	950	1,217
Muskoka.....	50	.....	.....	50
Nipissing.....	64	.....	.....	64
Norfolk.....	159	.....	.....	159
Northumberland.....	174	.....	.....	174
Ontario.....	282	.....	.....	282
Oxford.....	236	Woodstock.....	113	349
Parry Sound.....	39	.....	.....	39
Peel.....	283	.....	.....	283
Perth.....	154	Stratford.....	144	298
Peterboro.....	78	Peterboro.....	172	250
Prescott.....	49	.....	.....	49
Prince Edward.....	112	.....	.....	112
Rainy River.....	42	.....	.....	42
Renfrew.....	110	.....	.....	110
Russell.....	57	.....	.....	57
Simcoe.....	323	.....	.....	323
Stormont.....	71	.....	.....	71
Sudbury.....	101	.....	.....	101
Thunder Bay.....	29	Fort William.....	178	
		Pt Arthur.....	126	333
Temiskaming.....	127	.....	.....	127
Victoria.....	126	.....	.....	126
Waterloo.....	224	Galt.....	132	
		Kitchener.....	223	579
Welland.....	266	Niagara Falls.....	279	
		Welland.....	121	796
Wellington.....	131	Guelph.....	143	274
Wentworth.....	473	Hamilton.....	1438	1,911
York.....	1,083	Toronto.....	7,384	8,467
Foreign.....	376			376
	9,424		14,740	24,164

COMMERCIAL CARS REGISTERED, 1922

According to Occupations of Owners

Farmers.....	2,404
Merchants.....	4,287
Tradesmen.....	1,305
Professional.....	64
Manufacturers.....	556
Doctors.....	3
Livery and garages.....	726
Commercial Travellers.....	27
Firms.....	7,634
Real Estate Agents.....	13
Cartage Agents.....	2,312
Insurance Agents.....	5
Agents.....	718
Contractors.....	740
Undertakers.....	401
Clerks.....	90
Labourers.....	271
Managers.....	101
Police.....	24
Drovers.....	28
Soldiers.....	4
Unoccupied.....	590
Unclassified.....	887
Municipal Corporations.....	382
Public Utilities.....	260
Banks.....	2
Railways.....	10
Dominion Government.....	137
Ontario Government.....	174
Hospitals.....	9
	<hr/>
	24,164

COMMERCIAL CARS REGISTERED, 1922

Carrying Capacity

1½.....	9,084
1.....	10,496
1½.....	1,766
2.....	1,183
2½.....	365
3.....	271
3½.....	315
4.....	93
4½.....	50
5.....	407
5½.....	5
6.....	21
6½.....	3
7.....	1
Up.....	....
Electric.....	....
Fire Truck.....	104
	<hr/>
	24,164

Motive Power

Gasoline.....	24,149
Electric.....	12
Steam.....	3
	<hr/>
	24,164

Registrations

Originals....	5,349
Renewals....	18,815
	<hr/>
	24,164

Models			
Buses.....	316		
Delivery.....	4,655		
Trucks.....	18,688		
Ambulances.....	89		
Hearse.....	311		
Casket wagons.....	25		
Patrols.....	12		
Fire Trucks.....	84		
Street Cleaners.....	6		
			24,164

MOTORCYCLES REGISTERED, 1922

Counties		Cities		Total
Algoma.....	10	Sault Ste. Marie.....	45	55
Brant.....	30	Brantford.....	48	78
Bruce.....	11	.....	11	11
Carleton.....	48	Ottawa.....	190	238
Dufferin.....	8	.....	8	8
Dundas.....	4	.....	4	4
Durham.....	27	.....	27	27
Elgin.....	16	St. Thomas.....	21	37
Essex.....	58	Windsor.....	50	108
Frontenac.....	11	Kingston.....	38	49
Glengarry.....	4	.....	4	4
Grenville.....	8	.....	8	8
Grey.....	28	Owen Sound.....	15	43
Haldimand.....	11	.....	11	11
Haliburton.....	1	.....	1	1
Halton.....	39	.....	39	39
Hastings.....	10	Belleville.....	14	24
Huron.....	25	.....	25	25
Kenora.....	3	.....	3	3
Kent.....	16	Chatham.....	20	36
Lambton.....	18	Sarnia.....	21	39
Lanark.....	14	.....	14	14
Leeds.....	22	.....	22	22
Lennox and Addington.....	9	.....	9	9
Lincoln.....	36	St. Catharines.....	27	63
Manitoulin.....	3	.....	3	3
Middlesex.....	28	London.....	114	142
Muskoka.....	2	.....	2	2
Nipissing.....	13	.....	13	13
Norfolk.....	26	.....	26	26
Northumberland.....	18	.....	18	18
Ontario.....	59	.....	59	59
Oxford.....	43	Woodstock.....	25	68
Parry Sound.....	5	.....	5	5
Peel.....	34	.....	34	34
Perth.....	34	Stratford.....	51	85
Peterboro.....	7	Peterboro.....	23	30
Prescott.....	11	.....	11	11
Prince Edward.....	21	.....	21	21
Rainy River.....	9	.....	9	9
Renfrew.....	20	.....	20	20
Russell.....	4	.....	4	4
Simcoe.....	52	.....	52	52
Stormont.....	19	.....	19	19
Sudbury.....	19	.....	19	19
Thunder Bay.....	4	Fort William.....	22	
.....		Port Arthur.....	27	53
Temiskaming.....	17	.....	17	17
Victoria.....	19	.....	19	19
Waterloo.....	63	Galt.....	42	
.....		Kitchener.....	46	151
Welland.....	53	Niagara Falls.....	53	
.....		Welland.....	37	143
Wellington.....	29	Guelph.....	29	58
Wentworth.....	57	Hamilton.....	212	269
York.....	327	Toronto.....	2,166	2,493
Foreign.....		.....	
1,463		3,336		4,799

PROFESSIONAL DRIVERS LICENSED, 1922

Counties		Cities		Total
Algoma.....	91	Sault Ste. Marie.....	183	274
Brant.....	103	Brantford.....	297	400
Bruce.....	275	.....	.....	275
Carleton.....	149	Ottawa.....	1,219	1,368
Dufferin.....	77	.....	.....	77
Dundas.....	62	.....	.....	62
Durham.....	105	.....	.....	105
Elgin.....	112	St. Thomas.....	193	365
Essex.....	446	Windsor.....	727	1,173
Frontenac.....	49	Kingston.....	180	229
Glengarry.....	59	.....	.....	59
Grenville.....	95	.....	.....	95
Grey.....	163	Owen Sound.....	196	359
Haldimand.....	200	.....	.....	200
Haliburton.....	31	.....	.....	31
Halton.....	196	.....	.....	196
Hastings.....	228	Belleville.....	230	458
Huron.....	339	.....	.....	339
Kenora.....	47	.....	.....	47
Kent.....	204	Chatham.....	222	426
Lambton.....	163	Sarnia.....	132	295
Lanark.....	147	.....	.....	147
Leeds.....	212	.....	.....	212
Lennox and Addington.....	105	.....	.....	105
Lincoln.....	139	St. Catharines.....	299	438
Manitoulin.....	73	.....	.....	73
Middlesex.....	180	London.....	1,144	1,324
Muskoka.....	119	.....	.....	119
Nipissing.....	150	.....	.....	150
Norfolk.....	102	.....	.....	102
Northumberland.....	224	.....	.....	224
Ontario.....	302	.....	.....	302
Oxford.....	204	Woodstock.....	147	351
Parry Sound.....	83	.....	.....	83
Peel.....	67	.....	.....	67
Perth.....	101	Stratford.....	108	209
Peterboro.....	65	Peterboro.....	189	254
Prescott.....	104	.....	.....	104
Prince Edward.....	118	.....	.....	118
Rainy River.....	60	.....	.....	60
Renfrew.....	140	.....	.....	140
Russell.....	25	.....	.....	25
Simcoe.....	385	.....	.....	385
Stormont.....	113	.....	.....	113
Sudbury.....	177	.....	.....	177
Thunder Bay.....	10	Fort William.....	94	175
.....	.....	Port Arthur.....	71	203
Temiskaming.....	203	.....	.....	158
Victoria.....	158	.....	.....	.....
Waterloo.....	157	Galt.....	133	.....
.....	.....	Kitchener.....	192	482
Welland.....	380	Niagara Falls.....	260	.....
.....	.....	Welland.....	217	857
Wellington.....	150	Guelph.....	173	323
Westworth.....	175	Hamilton.....	1,645	1,820
York.....	608	Toronto.....	8,550	9,158
Foreign.....	70	.....	.....	70
.....	8,500	.....	16,801	25,301

TRAILERS REGISTERED, 1922

Counties		Cities		Total
Algoma.....	1	Sault Ste. Marie.....	1	1
Brant.....	7	Brantford.....	6	13
Bruce.....	2	.....	2	2
Carleton.....	.....	Ottawa.....	2	2
Dufferin.....	1	.....	.....	1
Dundas.....	2	.....	.....	2
Durham.....	.....	.....	.....	.....
Elgin.....	4	St. Thomas.....	3	7
Essex.....	24	Windsor.....	37	61
Frontenac.....	.....	Kingston.....	1	1
Glengarry.....	.....	.....	.....	.....
Grenville.....	.....	.....	.....	.....
Grey.....	5	Owen Sound.....	3	8
Haldimand.....	8	.....	.....	8
Haliburton.....	.....	.....	.....	.....
Halton.....	8	.....	.....	8
Hastings.....	.....	Belleville.....	1	1
Huron.....	35	.....	.....	35
Kenora.....	.....	.....	.....	.....
Kent.....	18	Chatham.....	9	27
Lambton.....	15	Sarnia.....	.....	15
Lanark.....	4	.....	.....	4
Leeds.....	.....	.....	.....	.....
Lennox and Addington.....	3	.....	.....	3
Lincoln.....	3	St. Catharines.....	5	8
Manitoulin.....	.....	.....	.....	.....
Middlesex.....	10	London.....	6	16
Muskoka.....	.....	.....	.....	.....
Nipissing.....	1	.....	.....	1
Norfolk.....	4	.....	.....	4
Northumberland.....	3	.....	.....	3
Ontario.....	2	.....	.....	2
Oxford.....	10	Woodstock.....	3	13
Parry Sound.....	1	.....	.....	1
Peel.....	2	.....	.....	2
Perth.....	1	Stratford.....	1	2
Peterboro.....	.....	Peterboro.....	3	3
Prescott.....	.....	.....	.....	.....
Prince Edward.....	.....	.....	.....	.....
Rainy River.....	.....	.....	.....	.....
Renfrew.....	1	.....	.....	1
Russell.....	.....	.....	.....	.....
Simcoe.....	1	.....	.....	1
Stormont.....	.....	.....	.....	.....
Sudbury.....	.....	.....	.....	.....
Thunder Bay.....	.....	Fort William.....	.....	.....
.....	.....	Port Arthur.....	.....	.....
Temiskaming.....	.....	.....	.....	.....
Victoria.....	.....	.....	.....	.....
Waterloo.....	7	Galt.....	2	.....
.....	.....	Kitchener.....	2	11
Welland.....	4	Niagara Falls.....	.....	.....
.....	.....	Welland.....	2	6
Wellington.....	4	Guelph.....	1	5
Wentworth.....	11	Hamilton.....	23	34
York.....	8	Toronto.....	140	148
Foreign.....	3	.....	.....	3
213		250		463

TRAILERS REGISTERED, 1922
Carrying Capacity

1 1/2	198
1	116
1 1/2	15
2	16
2 1/2	56
3	20
3 1/2	11
4	8
4 1/2	8
5	4
5 1/2	2
6	2
6 1/2	2
7	1
Up	3
	463



OTTAWA-POINT FORTUNE PROVINCIAL HIGHWAY
Old stone marking the boundary between Upper and Lower Canada at terminus of the Ottawa-Point Fortune Road at the Quebec Boundary.

PASSENGER CAR DEALERS' PERMITS, 1922

Counties		Cities		Total
Algoma.....	3	Sault Ste. Marie.....	10	13
Brant.....	6	Brantford.....	18	24
Bruce.....	25	.....	.....	25
Carleton.....	5	Ottawa.....	53	58
Dufferin.....	14	.....	.....	14
Dundas.....	6	.....	.....	6
Durham.....	5	.....	.....	5
Elgin.....	12	St. Thomas.....	18	30
Essex.....	22	Windsor.....	25	47
Frontenac.....	2	Kingston.....	19	21
Glengarry.....	11	.....	.....	11
Grenville.....	7	.....	.....	7
Grey.....	20	Owen Sound.....	7	27
Haldimand.....	21	.....	.....	21
Haliburton.....	.....	.....	.....	.....
Halton.....	15	.....	.....	15
Hastings.....	25	Belleville.....	24	49
Huron.....	30	.....	.....	30
Kenora.....	3	.....	.....	3
Kent.....	41	Chatham.....	21	62
Lambton.....	23	Sarnia.....	7	30
Lanark.....	15	.....	.....	15
Leeds.....	23	.....	.....	23
Lennox and Addington.....	16	.....	.....	16
Lincoln.....	6	St. Catharines.....	21	27
Manitoulin.....	4	.....	.....	4
Middlesex.....	31	London.....	38	69
Muskoka.....	11	.....	.....	11
Nipissing.....	12	.....	.....	12
Norfolk.....	19	.....	.....	19
Northumberland.....	20	.....	.....	20
Ontario.....	46	.....	.....	46
Oxford.....	18	Woodstock.....	8	26
Parry Sound.....	10	.....	.....	10
Peel.....	12	.....	.....	12
Perth.....	19	Stratford.....	20	39
Peterboro.....	2	Peterboro.....	21	23
Prescott.....	8	.....	.....	8
Prince Edward.....	10	.....	.....	10
Rainy River.....	6	.....	.....	6
Renfrew.....	18	.....	.....	18
Russell.....	6	.....	.....	6
Simcoe.....	36	.....	.....	36
Stormont.....	12	.....	.....	12
Sudbury.....	14	.....	.....	14
Thunder Bay.....	.....	Fort William.....	9	.....
.....	.....	Port Arthur.....	3	12
Temiskaming.....	12	.....	.....	12
Victoria.....	17	.....	.....	17
Waterloo.....	19	Galt.....	11	.....
.....	.....	Kitchener.....	21	51
Welland.....	7	Niagara Falls.....	11	.....
.....	.....	Welland.....	12	30
Wellington.....	15	Guelph.....	11	26
Wentworth.....	13	Hamilton.....	74	87
York.....	51	Toronto.....	239	290
Foreign.....	21	.....	.....	21
825		701		1,526

COMMERCIAL CAR DEALERS' PERMITS, 1922

Counties	Cities	Total
Algoma.....	Sault Ste. Marie.....	1
Brant.....	Brantford.....	3
Bruce.....	.....	.....
Carleton.....	Ottawa.....	3
Duffelin.....	.....	.....
Dundas.....	.....	.....
Durham.....	.....	.....
Elgin.....	St. Thomas.....	.....
Essex..... 2	Windsor.....	5
Frontenac.....	Kingston.....	2
Glengarry.....	.....	.....
Grenville.....	.....	.....
Grey..... 1	Owen Sound.....	1
Haldimand.....	.....	.....
Hastiburton.....	.....	.....
Halton..... 1	.....	1
Hastings.....	Belleville.....	.....
Huron.....	.....	.....
Kenora.....	.....	.....
Kent..... 1	Chatham.....	2
Lambton.....	Sarnia.....	1
Lanark.....	.....	.....
Leeds..... 1	.....	1
Lennox and Addington.....	.....	.....
Lincoln.....	St. Catharines.....	4
Manitoulin.....	.....	.....
Middlesex.....	London.....	10
Muskoka.....	.....	.....
Nipissing.....	.....	.....
Norfolk.....	.....	.....
Northumberland.....	.....	.....
Ontario..... 9	.....	9
Oxford..... 1	.....	1
Parry Sound.....	.....	.....
Peel..... 2	.....	2
Perth.....	Stratford.....	1
Peterboro.....	Peterboro.....	.....
Prescott.....	.....	.....
Prince Edward.....	.....	.....
Rainy River.....	.....	.....
Renfrew.....	.....	.....
Russell.....	.....	.....
Simcoe.....	.....	.....
Stormont..... 1	.....	1
Sudbury.....	.....	.....
Thunder Bay.....	Fort William.....	.....
.....	Port Arthur.....	.....
Temiskaming.....	.....	.....
Victoria.....	.....	.....
Waterloo.....	Galt.....	.....
.....	Kitchener.....	2
Welland.....	Niagara Falls.....	.....
.....	Welland.....	.....
Wellington.....	Guelph.....	.....
Wentworth..... 2	Hamilton.....	16
York..... 1	Toronto.....	23
Foreign.....	.....	-
.....	.....	73
.....	.....	95

MOTORCYCLE DEALERS' PERMITS, 1922

Counties	Cities	Total
Algoma.....	Sault Ste. Marie.....	.....
Brant.....	Brantford.....	.....
Bruce.....	.....	.....
Carleton.....	Ottawa.....	.....
Dufferin.....	.....	.....
Dundas.....	.....	.....
Durham.....	.....	.....
Elgin.....	St. Thomas.....	.....
Essex.....	Windsor.....	.....
Frontenac.....	Kingston.....	.....
Glengarry.....	.....	.....
Grenville.....	.....	.....
Grey.....	Owen Sound.....	.....
Haldimand.....	.....	.....
Haliburton.....	.....	.....
Halton.....	.....	.....
Hastings.....	Belleville.....	.....
Huron.....	.....	.....
Kenora.....	.....	.....
Kent.....	Chatham.....	.....
Lambton.....	Sarnia.....	.....
Lanark.....	.....	.....
Leeds.....	.....	.....
Lennox and Addington.....	.....	.....
Lincoln.....	St. Catharines.....	.....
Manitoulin.....	.....	.....
Middlesex.....	.....	.....
Muskoka.....	.....	.....
Nipissing.....	.....	.....
Norfolk.....	.....	.....
Northumberland.....	.....	.....
Ontario.....	.....	.....
Oxford.....	Woodstock.....	.....
Parry Sound.....	.....	.....
Peel.....	.....	.....
Perth.....	Stratford.....	1
Peterboro.....	Peterboro.....	1
Prescott.....	.....	.....
Prince Edward.....	.....	.....
Rainy River.....	.....	.....
Renfrew.....	.....	.....
Russell.....	.....	.....
Simcoe.....	.....	.....
Stormont.....	.....	.....
Sudbury.....	.....	.....
Thunder Bay.....	Fort William.....	.....
.....	Port Arthur.....	.....
Temiskaming.....	.....	.....
Victoria.....	.....	.....
Waterloo.....	Galt.....	.....
.....	Kitchener.....	.....
Welland.....	Niagara Falls.....	2
.....	Welland.....	.....
Wellington.....	Guelph.....	.....
Wentworth.....	Hamilton.....	1
York.....	Toronto.....	12
		16
		16

THE CHECKING OF CONCRETE ROAD SURFACES

By G. A. MACDONALD, Assistant Testing Engineer.

During the past, in laying concrete road surfaces in certain localities, the concrete has persistently checked, although every precaution has been taken to prevent it.

It was more or less prevalent during the summer of 1922 on certain contracts where the sub-grade was clay. A pavement was laid early in the autumn and it was selected for close observation. The concrete was laid on a brown clay sub-grade with stretches here and there that were inclined to be sandy. The contractor did not get started until well on in September, due to rain and bad weather.

About two weeks later, in an endeavour to expedite the work, owing to the lateness of the season, the contractor put on an evening shift, running from

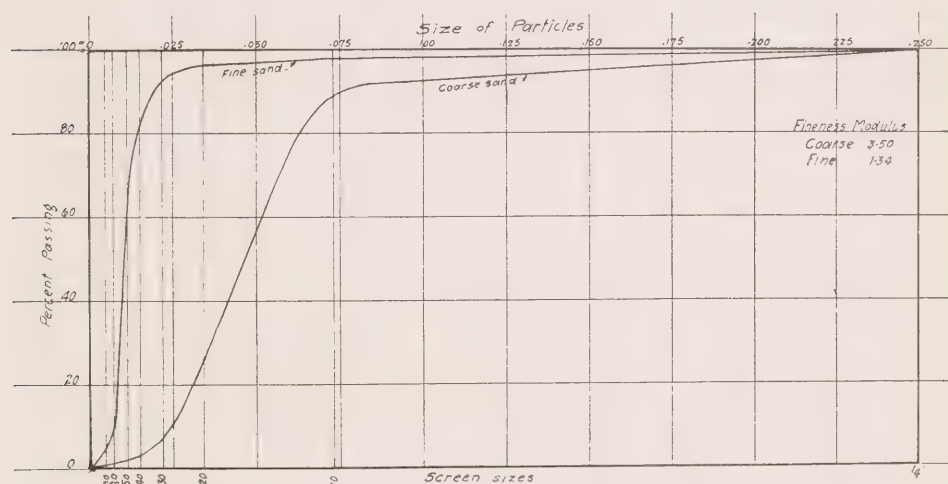


FIG. 1.—Mechanical analysis of fine and coarse sands used in experiments.

7.00 p.m. until 10.30 p.m. An examination of the previous day's work, one morning, revealed a check about two feet in length in the section laid by the evening shift. This eliminated the sun as a factor in this particular check. Points where dry batches and sandy batches were placed were marked and observed for checking, with no results. The sand was suspected and material from another source tried, with no betterment. An occasional check only was showing up, many slabs having none. The contraction of the concrete was making itself manifest in another way—it was pulling away from the expansion joint material for an eighth of an inch or more.

No change was noted in the character of the sub-grade except that it was drying out and becoming dusty from the traffic of the light batch trucks which supplied the mixer. After every move the sub-grade was well watered before laying concrete and the finished work was covered with tarpaulins.

The checking grew worse, until finally the contractor was asked to remove the loose-lying material upon the grade. This seemed to help somewhat. Two days of heavy rain stopped the work for a time and when operations were resumed it was observed no further checks occurred. The concrete was also

holding tight against the joints. In this connection it was noted that the contract was first started after a heavy rain and this apparently accounted for the non-appearance of checks early in the work.

The contractor was asked to keep the grade well wet down ahead of the work, and as a result only a very few checks occurred. With this information at hand and with the object of obtaining more complete data on the matter, an investigation of the problem was undertaken in the laboratory during the winter.

Small slabs were made, 18 inches square and 3 inches deep, of 1: 1½: 3 concrete, poured on clay bases. Base No. 1 was a saturated clay containing 26 per cent. moisture; base No. 2 was the natural clay as brought into the laboratory, with 14 per cent. moisture; and base No. 3 was clay that had been thoroughly dried, containing practically no moisture. The concrete slab on the dry base dried off quickly and was so firm in one hour and thirty minutes

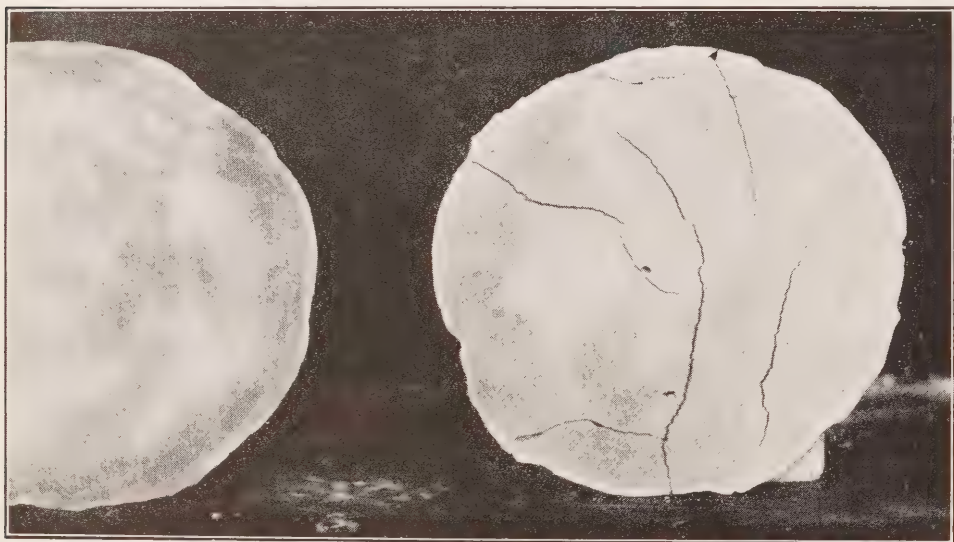


FIG. 2.—Neat concrete slabs on glass base.

Dried in moist closet.

Dried in open air.

that it could no longer be trowelled. The slab on the base with 14 per cent. moisture took its set in two hours. The slab on the saturated base dried off very slowly and set in five hours. No checking occurred in any of these slabs, but on the dry base and the base containing 14 per cent. moisture considerable contraction had taken place, as noted by the pulling away of the slab from the side-forms.

Mention will be made of slabs taking a set within a certain time. This may be defined as the time when the water has entirely disappeared from the surface and the mix has become sufficiently stiff so that further floating or trowelling brings no water to the surface, but leaves a smooth finish.

The ratio of depth to length of the above slabs was 1 : 6 and it was concluded that the cohesion of the concrete was sufficiently great to pull away from the side-forms before opening in the form of checks.

A second series of slabs were then made, ¾ inch in depth, the size, 18 inches by 18 inches, remaining the same, making a new ratio of 1:24. With this

depth it was impossible to use the stone as before and a 1: 3 mortar was substituted. Four slabs were made in this series: Slab No. 1 poured on the saturated base with 26 per cent. moisture; slab No. 2 poured on a dry pulverized base; slab No. 3 on a combination base, a dry centre 8 inches square and the remainder of the area wet; slab No. 4 on a dry base as No. 2, but with a wetter mix.

Slab No. 1 on the saturated base acted much the same as in the previous series. It still took five hours to set. Changing the thickness did not seem to alter this feature. Slab No. 2 on the dry base took only 20 minutes to set, so that it could no longer be trowelled. Slab No. 3, on the combination base, took 30 minutes, the portion over the dry base setting up first, but it rapidly drew the moisture from the remaining part. Slab No. 4, wet mix on the dry base, took 20 minutes. The only difference the wet mix made was to produce an inferior mortar of low strength. In removing it from the form it broke up easily. The slabs poured on the dry bases still showed considerable contraction by moving away from the forms, and they set so quickly that it was impossible to finish them properly. Not only did the water disappear but the cement as well was drawn down from the surface, leaving a rough finish. This feature serves to illustrate the quick setting many times observed on road construction, but most frequently blamed on the dry mix. Examination of the under side of the slab indicated that the different batches were failing to bond together properly at the bottom, due to their rapid setting on coming in contact with the dry clay.

Because the thin $\frac{3}{4}$ -inch slabs on the dry clay were so difficult to finish, it was thought best to find the minimum depth that would finish properly and to increase the size of the slab to get the larger ratio. 1: $1\frac{1}{2}$: 3 concrete was used in slabs 9 inches by 18 inches, of varying depths. Their setting times were as follows:

9" x 18" x 2"	set in 40 minutes.
9" x 18" x $2\frac{1}{2}$ "	set in 1 hour.
9" x 18" x 3"	set in 1 hour and 20 minutes.
9" x 18" x $3\frac{1}{2}$ "	set in 1 hour and 30 minutes.

The minimum depth that proved satisfactory for finishing was 3 inches.

The size of the slab was increased to 3 feet square with a depth of 3 inches. A 1: $1\frac{1}{2}$: 3 concrete was used with a very coarse sand. One small check about $1\frac{1}{2}$ inches in length occurred in this slab. A fine sand was used in the next slab in place of the coarse, but it failed to show any checks. Fig. 1 shows the mechanical analysis of the fine and coarse sand used in the above experiments and in the remainder of the tests.

At this point, due to the unsatisfactory results obtained so far, it was thought advisable to investigate the contraction of neat cement, having in mind the contraction cracks sometimes observed in the constancy of volume tests for cement.

Pats of neat cement were made about 6 inches in diameter, $\frac{1}{2}$ inch thick in the centre and thinning out to a feather edge. These were placed on the following bases: glass, blotting paper, brick, porous concrete and plaster of paris. On glass no checking was noticed until after it was 24 hours old. On blotting paper it dried out quickly, merely curling the edges up and failing to check. On brick it dried out very quickly and formed several large checks. On porous concrete it set up somewhat slower than on brick and checked badly. On plaster of paris it dried off quickly and formed but one short check.

These experiments showed that with the rapid loss of moisture considerable contraction occurred. This contraction took place irrespective of the type of

base, providing it had absorptive qualities. The checking was most severe on bases that had a high co-efficient of roughness, such as brick and porous concrete. On the plaster-of-paris base, which was quite smooth, the neat cement moved easily from the edges toward the centre during the period of contraction. This was not the case with the brick and cement bases. The neat cement remained where it was placed and contraction manifested itself by the opening up of large and irregular cracks.

The above experiments also tended to show that two distinct forms of contraction took place. On the glass plate it did not take place until after the final set and the mass had become rigid. On the other hand the absorptive bases showed the contraction and checking taking place while the mass was in a plastic state. The first was undoubtedly due to evaporation and the second to absorption.

A series of neat cement pats were made up on the following bases: glass, brick, and porous concrete, and were all placed in the moist closet. The pats

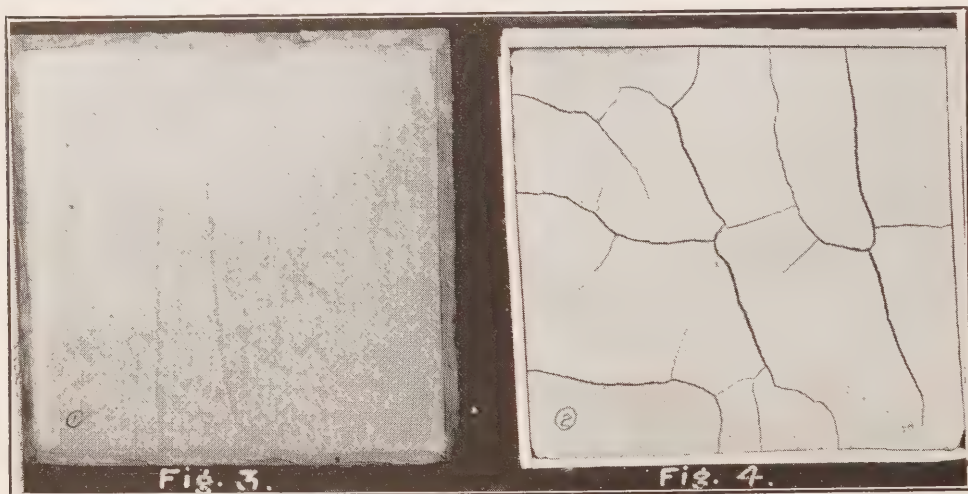


FIG. 3.—Neat concrete slab on glass base. Dried in open air, showing the shrinkage from side forms, but no checking.

FIG. 4.—Neat concrete slab on dry porous base, air dried, showing bad checking.

on brick and porous concrete checked to the same extent as in the open air. The pat on the glass plate remained at constant volume and showed no checks.

In Fig. 2 are shown the pats of neat cement made on glass; on the left cured in the moist closet and on the right air-dried, showing checks formed by evaporation.

The porous concrete base had proven to be the most satisfactory absorptive medium so far used where checking of the slab showed up as visible evidence of contraction. To standardize the results of further experiments, small forms were made 6 inches square and $\frac{1}{2}$ inch deep, giving a ratio of depth to length of 1: 12.

Three slabs were made up in these forms on porous concrete bases. Slab No. 1 was made of neat cement; slab No. 2 a 1:1 mortar using a coarse sand, and slab No. 3 a 1:1 mortar using fine sand. The neat cement slab checked badly; the coarse sand mortar showed one short check, and the fine sand mortar showed no checks.

New forms were made $8\frac{1}{4}$ inches square by $\frac{3}{8}$ inch deep, giving a ratio of length to depth of 1:22. The above experiment was repeated with neat cement, 1:1 mortar of coarse sand and 1:1 mortar of fine sand. The neat cement checked very badly, much greater than in any previous test. The coarse sand checked in several places, showing fine, wavy, hair-line cracks. The fine sand checked in one place only.

Two conclusions may be drawn from the above experiments. First, with the greater ratio of length to depth there is a corresponding greater tendency to check. Second, the richer the mix in cement, the greater the tendency to check. The 1:1 fine sand mix is leaner than the 1:1 coarse mix because of the higher water ratio to volume of cement for the same consistency.

A further series was then undertaken, using the $8\frac{1}{4}$ inch forms. Slab No. 1, neat cement on a glass plate; slab No. 2, 1:1 coarse sand mortar on glass

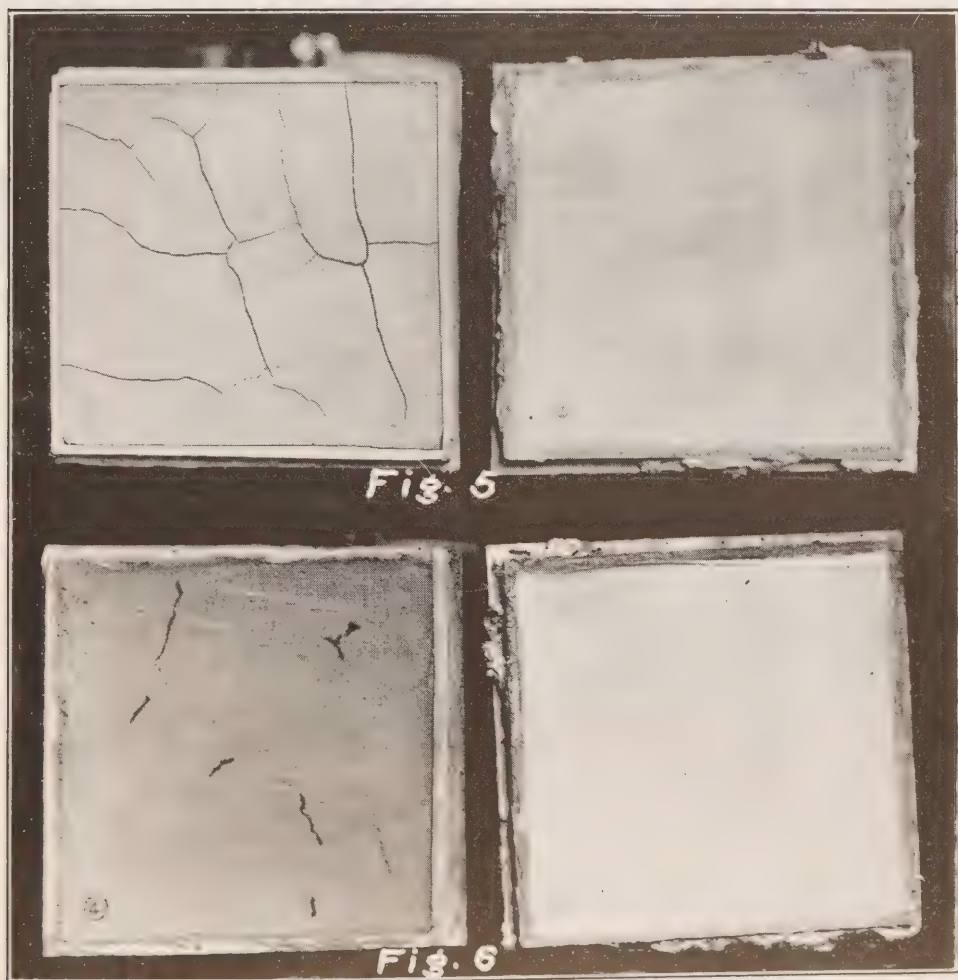


FIG. 5.—Neat cement slabs dried in air.

On dry porous base.

On saturated porous base.

FIG. 6.—Sand-mortar slabs air dried.

On dry porous base.

On saturated porous base.

plate; slab No. 3, neat cement; slab No. 4, 1: 1 coarse sand; slab No. 5, 1: 2 coarse sand, the last three on porous concrete bases. The neat cement nor the 1: 1 mortar on the glass did not check. The neat cement on the porous base checked badly; the 1: 1 mix developed several checks, but the 1: 2 showed none. It may be stated that at no time later did this neat cement slab on glass check as did the neat cement in the form of a pat in a previous experiment. The latter form with a thick centre and thin edges showed several checks. The shape of the specimen apparently has considerable effect on this action.

Humidity was next investigated. Six slabs were made up of neat cement. Two were made on glass plates, two on moderately absorptive bases, water being dashed on the porous concrete, and two on dry porous bases. One of each pair was placed in the moist closet immediately after pouring and the other was left to air-dry. The neat cement pulled away slightly from the forms on the glass plate in the open air but showed no movement whatever in the moist closet. On the moderately absorptive base, one check developed in the moist closet and three showed up in the open air. On the porous bases both slabs were badly checked. High humidity may have some effect in retarding checking on moderately absorptive bases, although the result was not very conclusive. On highly absorptive bases it apparently had no effect.

Experiments were next carried out to find the effect of using saturated bases. The same bases were used as for the previous tests, those requiring to be saturated were placed in water over night. Nine slabs in all were made in this series, introducing the three variables of base, humidity and mix. Five were allowed to remain in the open air. Slab No. 1, neat cement on glass plate; slab No. 2, neat cement on dry porous concrete; slab No. 3, neat cement on saturated concrete; slab No. 4, 1: 1 coarse sand on dry porous base; slab No. 5, 1: 1 coarse sand on saturated base.

The remaining forms were placed in the moist closet, viz.: slab No. 6, neat cement on dry base; slab No. 7, neat cement on saturated base; slab No. 8, 1: 1 coarse sand on dry base; and slab No. 9, 1: 1 coarse sand on saturated base. These slabs were all $8\frac{1}{4}$ inches square and $\frac{3}{8}$ inch in depth.

Examining the slabs air-dried:—

Slab No. 1, neat cement on glass plate (Fig. 3), had no checks but slight contraction is noted from the right hand form.

Slab No. 2, neat cement on dry porous base (Fig. 4), checked very badly.

Slab No. 3, neat cement on saturated base, showed no checks and very little contraction from the sides. Fig. 5 illustrates the above two slabs, the only variable is the base, on the left dry and porous, and on the right saturated.

Slab No. 4, 1: 1 coarse sand on dry base, checked slightly in six places. (Fig. 6, left.)

Slab No. 5, 1: 1 coarse sand on saturated base, showed no checks. (Fig. 6, right.)

The slabs cured in the moist closet gave the following results:—

Slab No. 6, neat cement on dry, porous base, checked at many points with broad cracks and also pulled away considerably from the side-forms. (Fig. 7 left.)

Slab No. 7, neat cement on saturated base, showed no checks and had the typical dull appearance of moist cured concrete. (Fig. 7, right.)

Slab No. 8, 1: 1 coarse sand on dry porous base, checked at twenty different points in fine hair-line cracks. (Fig. 8, left.)

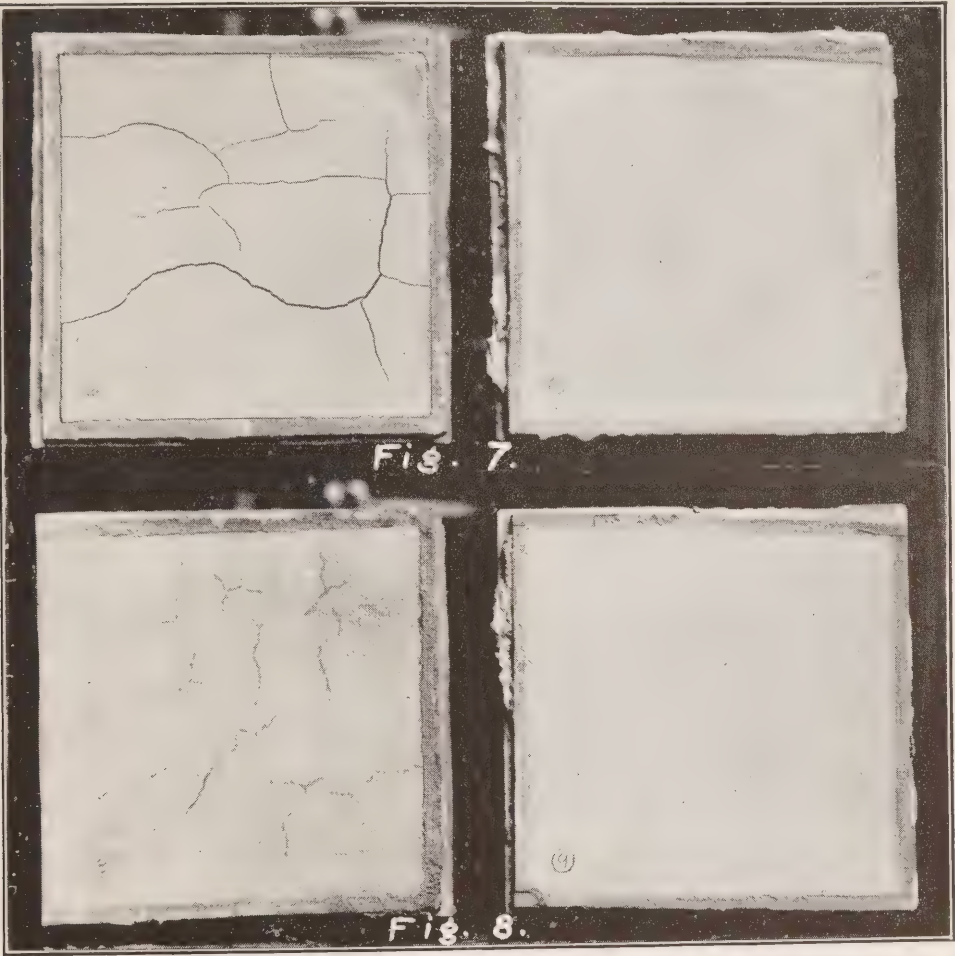


FIG. 7.—Neat concrete slabs cured in moist closet.

On dry porous base.

On saturated porous base.

FIG. 8.—1:1 Sand-mortar slabs cured in moist closet.

On dry porous base.

On saturated porous base.

Slab No. 9, 1: 1 coarse sand on saturated base, showed no evidence of contraction. (Fig. 8, right).

Slabs No. 7 and No. 9 may be said to have been cured under ideal conditions —no absorption or evaporation except while finishing could take place, and during their whole period of setting and acquiring strength they remained at constant volume and were under no contraction stress.

A study was undertaken to find the percentage of water lost by absorption and that lost by evaporation. Two slabs were made up of neat cement, $4\frac{1}{2}$ inches square and $\frac{3}{8}$ inch deep. These were placed on plaster-of-paris bases, one of which had been previously placed in water over night, and the other dried in the open air.

The slab on the dry absorptive base dried off quickly and set up so that it could easily be removed from the forms at the end of an hour. The increase in the weight of the plaster-of-paris base and of the side forms was carefully

noted and also the loss in weight of the cement slab at different intervals with the following results:—

Time	Percentage of original water content lost.		
	By absorption in base and forms	By evaporation	Total
0 hour.....	0%	0%	0%
1 hour.....	47	4	51
7 hours.....	..	17	64
24 hours.....	..	31	78
2 days.....	..	34	81
1 week.....	..	35	82
2 weeks.....	..	37	84
3 weeks.....	..	35	82

The slab on the saturated base was placed in the moist closet after it had set sufficiently to finish. While finishing 10 per cent. was lost by evaporation. After one week in the moist closet it was removed from the forms and allowed to dry out in the open air, with the following results:—

Time	Percentage of original water content lost.		
	By absorption	By evaporation	Total
0 hour.....	0%	0%	0%
5 hours.....	..	10	10
24 hours.....	..	12	12
2 days.....	..	14	14
1 week.....	..	16	16
2 weeks.....	..	28	28
3 weeks.....	..	30	30

The outstanding facts from these tests was the loss of 47 per cent. by absorption within an hour by the dry base, and 31 per cent. by evaporation within the first twenty-four hours of the air-dried specimen, leaving but 22 per cent. of the original water content for the process of hardening.

With the saturated base and the moist closet curing the water content was so conserved at the end of three weeks that 70 per cent. of the original amount had been used or was available for use in the chemical action of setting. This contrasts with 18 per cent. available at the same age in the previous test.

The results of the above tests are shown graphically in Fig. 9.

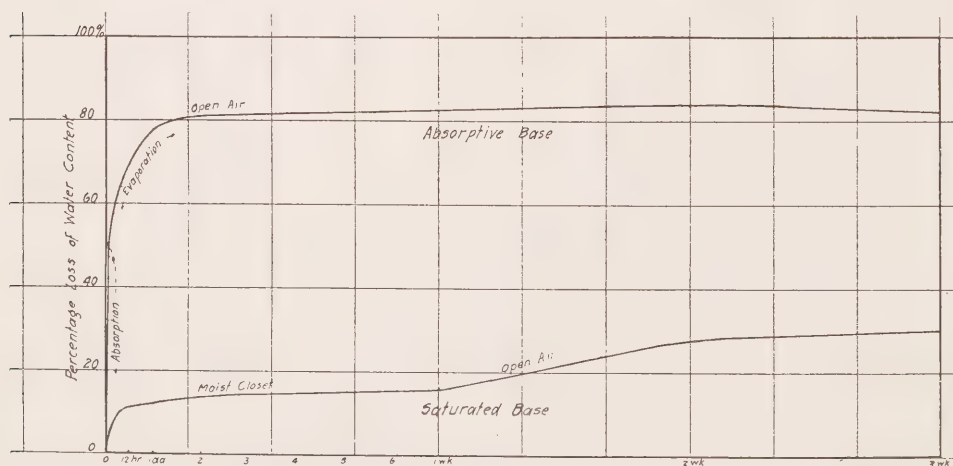


FIG. 9.—Graphic representation of the effect of a dry porous base, as compared with a saturated base, on a moisture content in neat cement mortars.

Attention was focused on the clay used in the previous experiments as an absorptive base. It was desired to obtain the rate of absorption and the amount: 250 c.c. of dry pulverized clay were placed in a 500 c.c. graduate and carefully covered with water to the 500 c.c. mark. Readings were taken every ten minutes of the water level in the container and the depth to which the moisture line had descended. The results are indicated by the curves in Fig. 10. Note the almost constant rate of absorption as shown by the number of inches of water required. After the moisture line had reached the bottom of the container, additional water was still required for saturation.

This condition is probably a parallel with the wetting down of a dusty sub-grade before pouring concrete. The thickness of an inch or less wet down merely acts as a vehicle for the further absorption of moisture from the concrete placed above it.

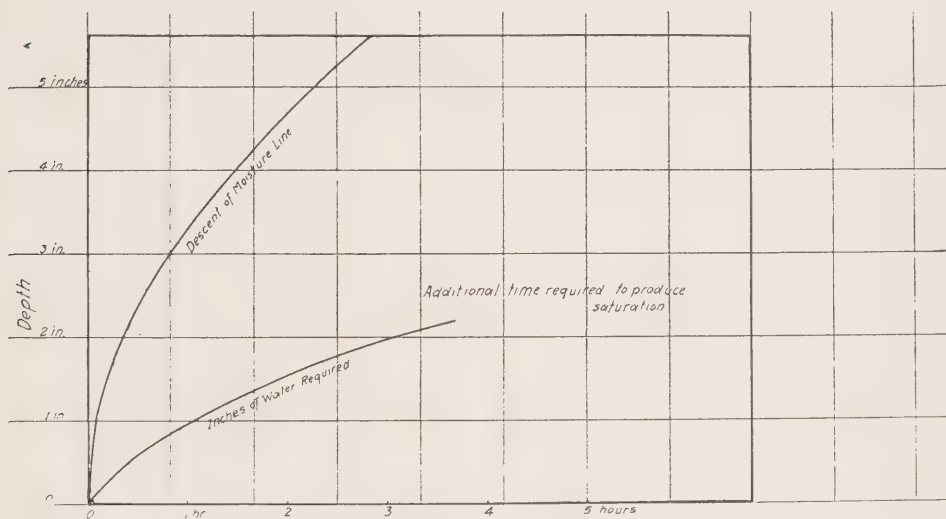


FIG. 10.—Graphic representation of the absorption of water by dry pulverized clay used as basis for specimens in experiments.

In further tests of slabs on dry clay, those made from neat cement checked. On tests of mortar slabs the high absorption was still evident, with its resulting contraction, but the base had very little restraining effect upon the movement of the slab. The slab was thus permitted to contract without the formation of checks. On large road surfaces where the slab cannot move as a whole while in a plastic state, this contraction takes place in the formation of checks where the slab has failed at its weakest point.

A test was made to find out if a saturated base would supply moisture to a slab, replacing that lost by evaporation. Two slabs were made up, one on a glass plate and one on a saturated plaster-of-paris base. There was no difference in the time of setting. After twenty-four hours the slab on the glass plate had contracted slightly from the forms but the slab on the saturated base had shown no movement, which would indicate that the wet base tends to restore the balance of water lost by evaporation.

To summarize the results:—

(1) Checking is the result of contraction caused by the loss of moisture from any cause when the concrete (cement or mortar) does not possess the required strength to overcome the outside restraining forces.

(2) An absorptive base hastens the time of setting of concrete and cement mortars—the greater the absorption the shorter the time of set.

(3) An absorptive base tends to draw the cement and fine material away from the surface, leaving the larger aggregate above the general contour of finish.

(4) An absorptive base does not permit the batches to bond together properly, due to their stiffening on coming in contact with an absorptive medium.

(5) The tendency for slabs to check increases with the increase in the ratio of length or width to depth. A 20-ft. pavement would check to a greater extent than an 18-ft. pavement if the thickness remained the same.

(6) The richer the mix is in cement the greater the contraction, with an increased tendency to check.

(7) Extra wet mixes may help to prevent checking on moderately absorptive bases, but the resulting concrete is of low strength.

(8) With no loss of moisture the concrete tends to remain at constant volume.

(9) A saturated base prevents all losses by absorption and may even supply moisture to the slab to replace losses by evaporation.

In making the results of practical application in road work, it is suggested that the procedure be somewhat as follows:—

On completion of a day's work the grade should be watered in preparation for the next day's work. Enough water should be placed on it and at such intervals so that it will not lie in pools or make the grade mucky. When the laying of concrete is commenced the area in front of the mixer should be well watered. This should bring about a condition close to saturation that would materially cut the losses by absorption. If the concrete materials are placed on the grade in front of the mixer it will be more difficult to follow the above procedure.

For the prevention of evaporation losses, dry covers such as tarpaulins laid directly on the concrete tend to aggravate the condition by absorbing additional moisture. Covers on frames may prevent the sun from increasing the temperature, but they will not stop evaporation. It is suggested that burlap strips be used, as has been done in some cases. They are 3 feet in width, of double-weight material and overlap each other. They are not as costly as tarpaulins and the actual cost of handling them is much less than moving heavy frames. They should be kept soaked with water and placed in that condition on the concrete when it has obtained a set, so that they will not mar it. These should be kept in a moist condition and not removed until just prior to covering the pavement with earth. If this procedure is followed a more uniform curing condition will result and at a time when the concrete is in greatest need of it.

APPENDICES

Nos. 1 to 6

APPENDIX

SUMMARY,

Statement of Work and Expenditure

County	Work Done During Year							
	Miles Graded	Miles Stoned	Miles Gravelled	Tile Drain Rods	Bridges	Pipe and Tile Culverts	Other Culverts	Roads and Culverts
Brant.....	6.05	Concrete 0.54	0.27	269	2	13	.....	\$ 42,779 70
Bruce.....	39.25	.....	21.33	19	.....	48	10	36,392 64
Carleton.....	28.12	.....	15.50	258	5	108	26	328,037 87
Dufferin.....	7.80	Bit. Mac. 6.37 Asp. Con. 1.83	.....	.....	.....	.....	.....	.....
Elgin.....	2.83	Concrete 0.82	2.01	1,086	1	28	4	17,157 78
Essex.....	8.08	.....	0.02	.....	6	8	5	8,703 94
Frontenac.....	16.25	15.25	1.00	.....	.....	34	2	37,761 82
Grey.....	4.50	.....	4.25	.....	2	.....	30	33,397 44
Haldimand.....	41.75	10.25	4.25	.....	1	212	.....	95,306 64
Halton.....	18.07	18.00	.....	.....	.....	.....	.....	10,418 40
Hastings.....	8.25	Concrete 1.57	.....	.....	.....	10	5	84,006 04
Huron.....	23.08	0.50	7.25	.....	3	54	.....	17,547 68
Kent.....	3.57	Concrete 3.38	19.75	.....	6	2	10	46,872 09
Lambton.....	10.75	.....	3,693	.....	3	10	8	8,703 94
Lanark.....	16.00	5.00	6.58	2,329	4	15	6	50,439 39
Leeds and Grenville.....	8.80	12.00	3.00	.....	1	19	.....	48,768 41
Lennox and Addington.....	4.00	13.50	2.40	.....	3	19	6	58,531 77
Lincoln.....	20.22	1.00	.....	.....	1	32	.....	9,178 23
Middlesex.....	32.12	18.98	.....	.....	.....	.....	.....	.....
Norfolk.....	8.40	5.64	1.80	.....	2	295	16	326,246 96
Northumberland and Durham.....	2.75	Concrete 0.30	.....	.....	.....	.....	.....	7,145 48
Ontario.....	5.62	.....	18.37	2,765	9	58	12	65,311 70
Oxford.....	23.25	4.50	2.50	36	2	25	3	79,452 49
Peel.....	13.50	.....	7.25	.....	.....	9	.....	5,868 51
Perth.....	0.79	0.25	1.40	.....	3	34	17	26,587 32
Peterboro.....	2.02	3.65	30.50	7,119	2	36	15	77,239 45
Prescott and Russell.....	79.24	21.25	845	.....	2	57	4	59,646 27
Prince Edward.....	4.15	0.79	.....	.....	5	6	1	15,329 76
Renfrew.....	14.70	2.02	.....	.....	.....	36	7	11,204 09
Simcoe.....	2.50	24.40	9.81	.....	3	109	40	448,483 12
Stormont, Dundas and Glengarry.....	31.24	2.50	.....	.....	.....	.....	.....	82,287 81
Victoria.....	1.49	7.90	.....	.....	1	25	.....	24,763 82
Waterloo.....	2.07	3.60	21.35	.....	4	190	78	201,419 65
Welland.....	29.63	2.50	2.50	3	6	25	3	14,779 19
Wellington.....	0.36	26.41	.....	98	.....	15	.....	137,712 85
Westworth.....	13.25	1.42	.....	85	1	84	5	13,600 54
York.....	33.48	0.59	.....	.....	.....	.....	.....	3,200 43
Totals.....	567.93	Concrete 0.54 Bit. Mac. 6.37 Asp. Con. 1.83	223.56	18,731	92	1,979	376	3,420,018 64

* Includes:—

W. B. Macadam.....	217.05 miles.
Concrete.....	6.40 "
Bituminous Macadam.....	26.45 "
Asphaltic Concrete.....	3.35 "

† NOTE.—Carried forward from 1921 expenditure.

No. 1

1922

on County Road Construction

Approved Expenditure for Year.

Machinery and Repairs	Special Grants to Towns and Villages	Purchase of Toll Roads and Gravel Pits	Superintendence	Approved Expenditure on Construction	Approved Expenditure on Maintenance	Total Approved Expenditure	Government Grant 40%	Disallowed	Receipts
\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
17,586 37			4,523 87	67,280 64	26,918 67	94,199 31	37,679 72	325 60	965 00
15,761 88	6,292 41		4,088 96	65,772 65	24,460 10	90,232 75	36,093 10	1,020 53	441 20
24,859 29			10,438 77	384,448 84	63,194 22	447,643 06	179,057 22	300 00	7,215 60
3,361 76	1,202 72		2,932 83	50,796 97	34,060 10	84,857 07	33,942 83		88 10
				773 75		773 75	309 50	Hold-back year	from last
21,248 76	5,221 07		3,384 65	71,772 59	71,993 60	143,766 19	57,506 48	23 50	948 10
19,099 23	54,358 32		4,101 46	86,262 95	69,600 79	155,863 74	62,345 50	125 00	15,116 72
2,510 60			2,086 85	42,359 27	20,631 98	62,991 25	25,196 50		
8,141 81	5,002 00		4,768 70	60,670 71	58,767 10	119,437 81	47,775 13	715 50	900 53
7,380 67	12,868 48		2,824 10	128,798 29	14,852 79	143,651 08	57,460 43	547 80	616 50
6,778 02			2,060 60	92,844 66	12,721 04	105,565 70	42,226 28		384 77
7,868 24			4,655 40	34,194 00	46,237 11	80,431 11	32,172 44		510 40
4,506 27	9,925 00	1,370 00	4,805 19	74,259 37	52,392 53	126,651 90	50,660 76		295 40
21,801 51	2,913 36		3,424 03	134,140 55	40,880 25	175,020 80	70,008 32	12,883 30	598 53
11,751 78	9,953 86		3,246 57	86,576 80	65,975 78	152,552 58	61,021 03		285 23
4,579 70			2,996 81	57,194 92	34,409 68	91,604 60	36,641 84		249 47
2,647 92	20,523 15		3,079 56	88,836 40	51,223 55	140,059 95	56,023 98	8,954 76	
9,339 09	11,147 44		2,234 43	33,064 48	26,051 24	59,115 72	23,646 29	35 00	
11,726 94		500 00	6,410 19	352,029 57	45,542 61	397,572 18	159,028 87	2,686 93	100 00
8,901 41	2,376 43		4,271 51	102,378 32	95,493 73	197,872 05	79,148 82	1,760 80	284 91
12,546 86	3,200 00		4,084 68	105,807 94	127,402 50	233,210 44	93,284 18		431 84
4,836 10	11,078 50		3,689 33	25,472 44	36,128 18	61,600 62	24,640 25	5,555 38	
4,700 54	546 15		5,401 01	41,580 08	31,630 51	73,210 59	29,284 24	210 60	607 20
8,913 56	2,524 09		2,837 28	93,303 53	34,126 98	127,430 51	50,972 20	1,972 27	3,568 98
2,511 96			2,821 67	69,765 74	34,608 69	104,374 43	41,749 77	10 00	139 75
			1,667 00	25,458 23	38,706 39	64,164 62	25,665 85	3,387 52	
2,651 46			2,349 35	16,204 90	26,543 75	42,748 65	17,099 46	1,062 46	54 00
9,219 41			3,354 37	543,344 71	20,574 75	563,919 46	225,567 78	23,671 01	3,877 75
				13,600 54	205 67	13,806 21	2,838 38	Hold-backs last year	(2) from
2,815 07	3,000 00		2,158 63	34,953 38	13,448 61	48,401 99	19,360 80	8 00	
6,294 86			5,530 70	235,896 12	19,637 59	255,533 71	102,213 48	19,470 99	
1,250 62	17,939 54		4,203 50	61,265 84	53,328 18	114,594 02	45,837 61	4,309 41	200 00
1,366 91	26,250 00		5,624 17	170,953 93	63,352 55	234,306 48	93,722 59		
138 25				150 25		150 25	60 10	Hold-back year	from last
13,789 24	1,465 02		5,010 53	27,450 83	49,416 17	76,867 00	30,746 80	918 79	
3,146 49	14,902 96		3,455 37	50,524 40	41,362 80	91,887 20	36,754 88	2,171 44	1,065 67
8,612 36	3,825 08		4,470 83	284,784 31	59,717 43	344,501 74	137,800 69		
7,531 18			3,553 14	75,867 59	84,062 28	159,929 87	63,971 95	1,451 76	1,281 13
8,467 30			3,922 30	127,208 38	57,703 17	184,911 55	73,964 62	7,250 10	
3,165 99	4,000 00		4,044 03	458,431 53	49,287 34	507,718 87	203,087 55	2,746 48	72 75
311,809 41	230,515 58	1,870 00	144,512 37	4,476,480 40	1,696,740 41	6,173,220 81	2,466,568 22	103,574 93	40,299 53

APPENDIX
SUMMARY,

Schedule of Expenditure on Maintenance

For the period beginning January 1st, 1922,

County	Grading	Culverts	Re-surfacing	Dragging	Oiling or Tarring
	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
Brant.....	967 66	189 67	23,080 66	1,898 18	325 22
Bruce.....	2,155 67	856 93	18,240 20	1,590 47	20 40
Carleton.....	1,639 39	1,345 45	40,281 43	767 54	15,101 60
Dufferin.....	6,076 24	293 38	25,718 32	1,366 29	.....
Elgin.....	9,902 81	1,567 71	51,627 75	6,386 88	38 71
Essex.....	1,456 14	518 92	52,400 05	10,849 49	1,959 36
Frontenac.....	3,738 58	558 17	15,554 10	22 80	336 00
Grey.....	3,475 77	3,122 92	46,851 71	2,315 95	.....
Haldimand.....	567 60	271 69	9,268 60	3,674 75	.....
Halton.....	516 60	265 03	10,783 34	944 52	.....
Hastings.....	4,182 73	2,168 25	34,067 47	1,624 46	1,425 79
Huron.....	6,023 53	4,448 60	32,001 07	3,017 74	2,425 82
Kent.....	4,467 70	287 50	21,095 08	9,835 97	.....
Lambton.....	4,187 79	731 66	42,821 78	7,375 47	*648 66
Lanark.....	8,823 34	987 73	21,801 70	1,212 38	.....
Leeds and Grenville.....	2,813 46	2,499 18	43,850 01	599 68	334 59
Lennox and Addington.....	1,637 36	336 75	22,925 69	.....	.....
Lincoln.....	1,297 88	876 13	27,172 38	4,487 08	6,705 56
Middlesex.....	2,367 82	2,958 14	65,508 83	11,840 18	2,145 58
Norfolk.....	10,490 20	259 04	113,478 71	1,494 67	.....
Northumberland and Durham	2,673 76	1,689 56	24,275 09	4,139 59	.....
Ontario.....	9,625 79	624 81	16,771 33	2,347 12	684 50
Oxford.....	1,052 88	2,942 19	26,718 10	1,302 73	.....
Peel.....	2,073 38	147 15	27,321 92	1,253 04	3,190 79
Perth.....	4,511 31	934 75	28,696 65	114 40	2,625 49
Peterboro.....	4,212 81	1,960 74	17,667 57	34 40	.....
Prescott and Russell.....	3,642 12	258 90	12,153 60	1,503 20	.....
		295 67			
Prince Edward.....	74 00	.....	10,726 85	43 15	2,340 36
Renfrew.....	2,157 89	1,292 33	9,877 63	1,255 66	4,684 11
Simcoe.....	2,271 60	350 21	43,506 26	3,202 39	251 14
Stormont, Dundas and Glen- garry.....	1,431 58	1,345 92	38,414 01	2,027 89	18,274 85
Victoria.....	1,551 10	6,142 25	38,401 56	1,957 99	333 12
Waterloo.....	1,276 83	663 85	34,532 81	1,035 66	.....
Welland.....	1,451 77	71 75	55,345 59	370 10	2,226 18
Wellington.....	10,118 49	5,673 06	53,432 46	8,930 63	1,095 27
Wentworth.....	11,161 12	4,200 13	38,657 34	1,019 75	2,664 83
York.....	4,131 46	914 31	33,444 55	1,021 82	8,833 69
Totals.....	140,206 10	54,050 37	1,228,472 20	102,863 90	78,671 62

No. 2
1922
and Repair on County Roads
and ending December 31st, 1922.

Snow Shovelling	Bridges	Ditching and Draining	Cutting Weeds and Brush	Wire Fence Bonus	Total Expenditure	Total Government Grant, 40%
\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
96 63			360 65		26,918 67	10,767 46
363 74	1,006 89		225 80		24,460 10	9,784 04
2,516 40	274 14	877 89	390 38		63,194 22	25,277 69
176 94	176 61	252 32			34,060 10	13,624 04
50 80	711 09	362 47	1,345 38		71,993 60	28,797 44
	638 94	1,538 04	239 85		69,600 79	27,840 31
201 67	20 25			200 41	20,631 98	8,252 79
1,200 52	841 03			959 20	58,767 10	23,506 84
	695 55		374 60		14,852 79	5,941 11
	211 55				12,721 04	5,088 42
870 42	1,797 55		100 50		46,237 11	18,494 84
446 18	2,975 92	479 84	573 83		52,392 53	20,957 01
	852 62	3,407 60	933 78		40,880 25	16,352 10
	7,605 76	2,234 80	369 86		65,975 78	26,390 31
794 60	789 93				34,409 68	13,763 87
	1,007 73			118 90	51,223 55	20,489 42
246 03	530 23		375 24		26,051 24	10,420 50
19 62	525 21	3,801 23	657 52		45,542 61	18,217 04
208 50	5,364 15	3,097 56	2,002 97		95,493 73	38,197 49
942 10	448 82		288 96		127,402 50	50,961 00
562 65	872 33	1,477 77	437 49		36,128 18	14,451 27
316 75	206 41		478 30	575 50	31,630 51	12,652 20
166 76	697 33	556 80	638 79	51 40	34,126 98	13,650 79
	599 97		22 44		34,608 69	13,843 48
1,386 58	437 21				38,706 39	15,482 56
143 07	2,070 35	373 16	18 00	63 65	26,543 75	10,617 50
896 94	2,119 99				20,574 75	8,229 90
			Hold-back from last year		295 67	118 27
	264 25				13,448 61	5,379 44
215 65	145 63		8 75		19,637 59	7,855 04
1,016 29	599 70			2,130 59	53,328 18	21,331 27
793 45	369 90		694 95		63,352 55	25,341 02
106 63	171 14		187 65	564 73	49,416 17	19,766 47
106 06	3,747 59				41,362 80	16,545 12
82 60	114 89		54 55		59,717 43	23,886 97
436 38	2,086 85	1,255 72		1,033 42	84,062 28	33,624 91
					57,703 17	23,081 27
935 41	6 10				49,287 34	19,714 94
15,299 37	40,983 61	19,715 20	10,780 24	5,697 80	1,696,740 41	678,696 14

*Calcium chloride.

APPENDIX

SUMMARY,

Statement of Work and Expenditure on

County	Work Done During Year						
	Miles Graded	Miles Stoned	Miles Gravelled	Tile Drain Rods	Bridges	Pipe and Tile Culverts	Other Culverts
Brant.....	6.25	Concrete 2.50	.....	38	1	15	.....
Bruce.....	32.25	1.25	17.25	180	3	37	10
		4.50					
Carleton.....	3.50	Asp. Con. 2.75	0.75	66	1	9	15
		Bit. Mac. 3.50					
Dufferin.....	5.30	1.00	3.60	.....	1	22	1
Elgin.....	0.75	.....	0.75	497	.....	1	.....
Essex.....	8.62	Concrete 8.27	2.75	3,723	.....	8	2
Frontenac.....	0.12	.....	.....	.....	3	7	.....
		2.50					
Grey.....	14.00	Concrete 1.12	10.75	.....	.....	2	49
Haldimand.....	8.50	.....	.....	.....	.....	33	.....
Halton.....	0.50	0.50	.....	42	2	6	1
Hastings.....	7.63	4.04	2.29	.....	.....	25	.....
Huron.....	5.25	.....	5.25	.....	.....	2	11
Kent.....	9.72	Concrete 8.87	.....	80	4	34	3
Lambton.....	5.25	1.75	2.00	1,625	2	34	4
Lanark.....	2.75	Concrete 2.75	.....	250	1	34	8
Leeds and Grenville.....	0.50	0.50	.....	.....	.....	6	1
Lennox and Addington.....	7.77	3.27	1.00	.....	.....	38	.....
Lincoln.....	.....	.....	.....	.....	.....	.....	.....
Middlesex.....	0.75	.....	.....	1,164	.....	.....	3
Norfolk.....	2.12	2.12	.....	.....	2	6	.....
Northumberland and Durham.....	7.00	.....	4.37	.....	.....	34	.....
Ontario.....	7.40	1.00	1.50	.....	4	32	8
Oxford.....	.....	3.00	.....	40	.....	.....	.....
Peel.....	.....	.....	.....	.....	.....	.....	.....
		Concrete †0.75	.....	.....	.....	.....	.....
Perth.....	0.75	.....	0.75	151	1	.....	.....
Peterboro.....	0.87	.....	0.87	.....	.....	16	2
Prescott and Russell.....	.....	.....	.....	.....	.....	.....	.....
Prince Edward.....	3.13	2.88	.....	.....	.....	22	.....
Renfrew.....	10.80	12.70	.....	.....	1	72	45
Simcoe.....	6.83	.....	5.83	.....	1	18	8
Stormont, Dundas and Glengarry.....	22.00	19.00	.....	60	1	10	4
	
Victoria.....	12.33	Bit. Mac. 4.33	6.35	135	1	117	6
		2.27					
Waterloo.....	4.09	Asp. Con. 0.05	.....	.....	2	6	2
		Concrete 2.59	.....	.....	.....	.....	.....
Welland.....	11.03	7.03	.....	.....	.....	11	.....
Wellington.....	0.31	2.00	.....	.....	1	.....	.....
		4.50	.....	.....	.....	.....	.....
Wentworth.....	7.37	Concrete 2.87	.....	.....	1	13	5
		2.15	.....	.....	.....	.....	.....
York.....	6.62	Asp. Con. 2.08	1.91	.....	1	59	7
Totals.....	222.06	* 120.39	67.97	8,051	34	695	195

*Includes:—

W. B. Macadam..... 79.02 miles
 Concrete..... 28.72 "
 Bituminous Macadam..... 7.77 "
 Asphaltic Concrete..... 4.88 "

†NOTE.—Carried forward from 1921 expenditure.

No. 3

1922

Provincial County Road Construction

Approved Expenditure for Year									
Roads and Culverts	Bridges	Special Grants to Towns and Villages	Approved Expenditure on Construction	Approved Expenditure on Maintenance	Total Approved Expenditure	Government Grant 60%	Dis-allowed	Receipts	
\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
67,467 49	7,475 54		74,943 03	46,546 22	121,489 25	72,893 55			
76,398 10	11,904 84	3,724 81	92,027 75	20,367 75	112,395 50	67,437 30			
230,699 70	6,541 48		237,241 18	19,652 15	256,893 33	154,135 99			
15,866 65	1,325 85	9,950 00	27,142 50	11,981 81	39,124 31	23,474 58	2,029 93		
3,195 34		1,618 97	4,814 31	10,977 07	15,791 38	9,474 83			
253,847 65			253,847 65	37,589 30	291,436 95	174,862 17	1,926 30	228 47	
1,840 21	4,014 85		5,855 06	9,337 50	15,192 56	9,115 54			
122,880 74		8,650 00	131,530 74	3,068 55	134,599 29	80,759 57			
16,573 13			16,573 13	272 75	16,845 88	10,107 53			
8,071 59	3,294 79		11,366 38	8,611 94	19,978 32	11,986 99			
29,131 66			29,131 66	22,885 14	52,016 80	31,210 08	8,272 80		
16,592 25	2,814 27	1,396 00	20,802 52	26,954 66	47,757 18	28,654 31			
211,678 43	16,340 90	1,117 45	229,136 78	25,962 65	255,099 43	153,059 66	15 00	572 75	
60,456 15	5,270 50	1,437 92	67,164 57	20,833 42	87,997 99	52,798 79		34 80	
42,703 05			42,703 05	8,844 84	51,547 89	30,928 73		504 63	
3,922 86			3,922 86	21,205 87	25,128 73	15,077 24			
35,333 00			35,333 00	10,266 58	45,599 58	27,359 75			
4,709 57			4,709 57	14,975 87	19,685 44	11,811 26			
40,817 62	1,798 09		42,615 71	9,526 81	52,142 52	31,285 50			
19,992 42		7,583 47	27,575 89	21,100 86	48,676 75	29,206 05	4,143 92		
18,702 46	11,310 95	825 49	30,838 90	19,946 73	50,785 63	30,471 37		151 75	
4,774 51			4,774 51	4,115 80	8,890 31	5,334 19		30 00	
10,531 15			10,531 15		10,531 15	6,318 60	Hold-back	from last	
3,233 12	900 00		4,133 12	5,322 81	9,455 93	5,673 56	year		
5,150 54			5,150 54	5,452 32	10,602 86	6,361 72			
				1,049 16	1,049 16	629 50			
				† 330 00	330 00	198 00	Hold-back	from last	
							year		
16,602 85			16,602 85	8,846 98	25,449 83	15,269 90			
182,149 06	1,137 60		183,286 66	11,299 97	194,586 63	116,751 98			
35,967 96	1,024 11	11,847 93	48,840 00	30,587 47	79,427 47	47,656 48	1,585 28		
119,616 42	2,170 25		121,786 67	30,090 30	151,876 97	91,126 18			
† 119 15			119 15	10 50	120 71	77 83	Hold-back	from last	
							year		
109,529 89	2,095 80	2,027 32	113,653 01	11,269 33	124,922 34	74,953 40	441 14		
58,286 12	16,597 84	4,095 48	78,979 44	8,367 50	87,346 94	52,408 16	50 40		
157,613 32	1,380 00	39,706 35	198,699 67	24,989 82	223,689 49	134,213 69			
1,972 96	5,884 80	1,943 25	9,801 01	30,788 62	40,589 63	24,353 78		5 85	
91,435 05	928 56		92,363 61	3,818 72	96,182 33	57,709 40			
127,413 03	9,148 74		136,561 77	12,508 99	149,070 76	89,442 46		15 76	
2,211,275 20	113,359 76	95,924 44	2,420,559 40	559,756 82	2,980,316 22	1,788,189 71	18,464 77	1,544 01	

APPENDIX
SUMMARY,

Schedule of Expenditure on Maintenance

For the period beginning January 1st,

County	Grading	Culverts	Re-surfacing	Dragging	Oiling or Tarring
	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
Brant.....	4,220 86	247 60	32,855 28	3,548 52	4,422 24
Bruce.....	1,623 06	464 09	14,061 69	1,364 21	.....
Carleton.....	520 59	263 08	10,043 85	75 85	6,834 35
Dufferin.....	1,510 82	104 72	9,116 16	706 42	232 70
Elgin.....	727 80	190 01	8,137 36	1,506 98	.....
Essex.....	16 00	214 84	27,932 49	4,287 80	4,549 75
Frontenac.....	1,388 17	319 40	5,979 43	.....	1,209 40
Grey.....	290 25	24 90	2,398 10	167 50	.....
Haldimand.....	.....	14 50	.....	247 45	.....
Halton.....	117 20	72 60	7,988 40	353 85	.....
Hastings.....	8,359 41	1,210 34	10,806 49	456 09	1,056 36
Huron.....	1,835 54	2,586 88	17,793 68	1,700 99	421 91
Kent.....	3,074 66	118 49	15,742 13	3,462 16	.....
Lambton.....	1,150 96	210 35	14,086 45	2,249 80	285 76
Lanark.....	520 00	123 60	4,635 72	376 25	2,432 52
Leeds and Grenville.....	1,371 30	25 86	18,839 25	907 66	.....
Lennox and Addington.....	1,437 96	5 00	8,456 78	24 75	.....
Lincoln.....	.....	.....	.....	.....	.....
Middlesex.....	218 65	83 80	11,786 75	1,951 48	118 61
Norfolk.....	1,209 04	.....	7,316 32	156 21	320 00
Northumberland and Durham	1,461 10	511 18	16,173 50	1,745 90	.....
Ontario.....	6,733 50	336 17	10,183 09	1,205 84	239 81
Oxford.....	275 50	345 80	2,879 89	292 70	.....
Peel.....	.....	.....	.....	.....	.....
Perth.....	1,136 39	146 65	3,686 39	.....	211 55
Peterboro.....	1,809 28	208 99	3,306 35	.....	.....
Prescott and Russell.....	110 20	.....	869 46	.....	.....
Prince Edward.....	15 45	{ 330 00 3,217 42 }	47 25	5,531 56	.....
Renfrew.....	346 92	185 85	827 22	212 00	9,663 88
Simcoe.....	2,076 00	27 43	25,438 22	564 60	1,771 42
Stormont, Dundas and Glen- garry.....	406 79	346 63	6,197 60	250 11	20,900 91
Victoria.....	573 10	564 85	{ 10 56 7,345 94 }	1,167 78	499 52
Waterloo.....	237 05	99 44	7,133 34	378 90	.....
Welland.....	106 80	11 35	12,158 69	448 40	12,174 33
Wellington.....	2,612 75	994 46	20,996 80	2,826 74	1,581 22
Wentworth.....	563 50	.....	1,228 50	.....	2,026 72
York.....	1,185 71	306 19	8,448 68	259 88	2,124 03
Totals.....	49,242 31	13,912 47	354,907 81	38,428 38	73,076 99

per year

No. 4

1922

and Repair on Provincial County Roads

1922, and ending December 31st, 1922.

Snow Shovelling	Bridges	Ditching and Draining	Cutting Weeds and Brush	Wire Fence Bonus	Total Expenditure	Total Government Grant, 60%
\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
317 46	364 36		569 90		46,546 22	27,927 73
227 66	2,378 28		248 76		20,367 75	12,220 65
685 61	717 11	380 76	130 95		19,652 15	11,791 29
142 59	10 50	157 90			11,981 81	7,189 09
8 90	31 15	58 45	316 42		10,977 07	6,586 24
	204 90	216 32	167 20		37,589 30	22,553 58
86 12	87 89	173 57		93 52	9,337 50	5,602 50
169 80				18 00	3,068 55	1,841 13
			10 80		272 75	163 65
	79 89				8,611 94	5,167 16
332 15	488 38		175 92		22,885 14	13,731 08
210 90	2,035 53	193 73	175 50		26,954 66	16,172 80
	2,604 72	373 81	586 68		25,962 65	15,577 59
Operating Ferry						
1,408 75	195 34	709 21	536 80		20,833 42	12,500 05
324 50	432 25				8,844 84	5,306 90
				61 80	21,205 87	12,723 52
259 34	38 25	26 00	18 50		10,266 58	6,159 95
37 85	422 09	63 57	293 07		14,975 87	8,985 52
37 10	427 45		60 69		9,526 81	5,716 08
194 18	484 60	475 90	54 50		21,100 86	12,660 52
221 55	178 90		293 80	554 07	19,946 73	11,968 04
209 19	30 61	16 26	60 10	5 75	4,115 80	2,469 48
39 35	102 48				5,322 81	3,193 69
3 70	8 60		99 50	15 90	5,452 32	3,271 39
69 50					1,049 16	629 50
			Hold-back from last year		330 00	108 00
35 30					8,846 98	5,308 19
1 50			62 60		11,299 97	6,779 98
221 60	286 40			201 80	30,587 47	18,352 48
797 10	708 56		482 60		30,090 30	18,054 18
			Hold-back from last year		10 56	6 34
94 55	151 49		258 20	613 90	11,269 33	6,761 60
	518 77				8,367 50	5,020 50
			85 00		24,989 82	14,993 89
5 25				287 60	30,788 62	18,473 17
123 05	657 74	708 26			3,818 72	2,291 23
					12,508 99	7,505 40
172 66	11 84					
6,437 21	13,658 08	3,553 74	4,687 49	1,852 34	559,756 82	335,854 09

APPENDIX No. 5

SUMMARY, 1922

Expenditure on Township Roads

The following schedule shows in detail the work and approved expenditure on Township Roads during 1922, and upon which Provincial subsidies were paid in 1923, under the provisions of The Ontario Highways Act.

Number of Town- ships	Approved Expenditure for Year					Superintendence		Total Approved Expenditure	Total Governm't Grant		
	Roads and Culverts	Bridges	Maintenance	Machinery	Purchase of Gravel Pits	Approved Expenditure	Governm't Grant 40%				
313	\$774,336 84	\$374,158 51	\$1,832,200 75	\$87,936 37	\$23,573 06	\$3,092,205 53	\$618,440 93	\$77,900 44	\$31,160 55	\$3,170,105 97	\$649,601 48

APPENDIX No. 6

REPORT ON TRAFFIC CENSUS, 1922

Kingston-Montreal Road

August 30th to September 5th, 1922, inclusive; 6 a.m. to 10 p.m., Eastern Standard time.

Location of Observer	Year	Passenger Automobiles	Light Motor Trucks	Heavy Motor Trucks	Motor Busses	Steam Engines and Lorries	1-Horse Vehicles	2-Horse Vehicles	Total Daily Average	Maximum for 1 day
Johnstown Corner.....	1922	214.4	4.4	.5	7.3	.3	22.4	17.9	267.2	403
West limits of Cornwall.....	1922	572.9	57.9	11.2	1.1	1.7	157.0	41.7	843.5	943
Quebec Boundary.....	1922	90.4	.9	.9	.....	.3	19.9	20.2	112.6	136
West of Brockville, E. side of Lynn Road.....	1922	608.1	47.2	8.0	.3	.3	111.6	46.0	821.5	.....
	1914	136.9	.8	.....	.....	.....	208.8	67.9	414.4	539
East of Brockville, opposite Lot 1, Con. 1, Elizabethtown Twp....	1922	513.6	9.7	32.7	6.3	.1	52.7	15.1	630.2	.....
	1914	38.0	.....	.....	.....	.....	49.2	9.7	96.9	114
East of Kingston, opposite Lot 1, Con. 1, Township of Pittsburg	1922	746.9	50.8	11.0	5.0	.3	95.4	30.9	940.3	1,047

Ottawa-Prescott Road

August 30th to September 5th, 1922, inclusive; 6 a.m. to 10 p.m., Eastern Standard Time.

Location of Observer	Year	Passenger Automobiles	Light Motor Trucks	Heavy Motor Trucks	Motor Busses	Steam Engines and Lorries	1-Horse Vehicles	2-Horse Vehicles	Total Daily Average	Maximum for 1 day
Cons. 1 and 2, Oxford Township Intersection with Ottawa-Perth Road.....	1922	376.1	20.7	16.5	4.9	2.0	66.7	77.0	563.9	.....
	1922	467.4	20.3	4.3	2.4	1.0	20.6	14.3	550.3	.....
	1914	11.2	0.5	.....	.....	.....	36.8	45.9	94.4	101
Johnstown Corner.....	1922	409.6	9.9	1.8	9.4	.1	28.4	19.8	479.0	808

Ottawa-Point Fortune Road

August 30th to September 5th, 1922, inclusive; 6 a.m. to 10 p.m., Eastern Standard Time.

Location of Observer	Year	Passenger Automobiles	Light Motor Trucks	Heavy Motor Trucks	Motor Busses	Steam Engines and Lorries	1-Horse Vehicles	2-Horse Vehicles	Total Daily Average	Maximum for 1 day
East of Ottawa, at "Quarries"....	1922	677.1	83.8	12.8	27.6	6.0	23.63	100.7	1,143.3	2,766
	1914	39.0	4.6	.....	.....	.....	88.1	71.3	203.0	344
Lot 7, Con. 1, L'Original Town ship.....	1922	155.7	6.1	.....	.....	.....	68.3	8.8	238.9	305
Point Fortune.....	1922	134.9	1.5	2.8	.....	.....	28.7	8.8	216.7	294

Ottawa-Pembroke Road

August 30th to September 5th, 1922, inclusive; 6 a.m. to 10 p.m., Eastern Standard Time.

Location of Observer	Year	Passenger Automobiles	Light Motor Trucks	Heavy Motor Trucks	Motor Busses	Steam Engines and Lorries	1-Horse Vehicles	2-Horse Vehicles	Total Daily Average	Maximum for 1 day
Opposite Lots 20 and 21, Cons. 3 and 4, Fitzroy Township....	1922	255.7	15.6	1.5	4.6	.1	38.6	48.8	371.0	796
Opposite Lot 21, Con. 1, Admas- ton Township.....	1922	41.0	1.2	.....	.....	.1	8.6	15.6	66.5	82

Ottawa-Kingston Road

August 30th to September 5th, 1922, inclusive; 6 a.m. to 10 p.m., Eastern Standard Time.

Location of Observer	Year	Passenger Automobiles	Light Motor Trucks	Heavy Motor Trucks	Motor Busses	Steam Engines and Lorries	1-Horse Vehicles	2-Horse Vehicles	Total Daily Average	Maximum for 1 day
North of Kingston at junction with Kingston Mills Road....	1922	298.0	2.7	7.1	1.1	.1	42.8	50.3	392.1	567
	1914	6.4	0.3	.....	.....	.....	29.3	11.6	47.6	104
Crosby Corners.....	1922	238.3	7.6	4.5	.6	.7	124.9	70.6	456.2	494
Lombardy.....	1922	347.0	10.1	8.3	.....	.....	111.7	40.4	517.5	673
Intersection with Ottawa-Pres- cott Road.....	1922	122.3	5.4	6.6	2.1	.1	7.9	14.7	159.1	.....
West side Bell's Corners Inter- section.....	1922	225.0	25.7	10.3	.1	.1	26.0	9.3	296.5	.....
	1914	34.9	1.6	.....	.....	.....	55.5	21.2	118.6	150
Lot 7, Con. 3, Drummond Town- ship.....	1922	83.3	1.5	1.2	.....	.....	40.7	11.0	137.7	.....

Kingston-Belleville Road

August 30th to September 5th, 1922, inclusive; 6 a.m. to 10 p.m., Eastern Standard Time.

Location of Observer	Year	Passenger Automobiles	Light Motor Trucks	Heavy Motor Trucks	Motor Busses	Steam Engines and Lorries	1-Horse Vehicles	2-Horse Vehicles	Total Daily Average	Maximum for 1 day
East of Belleville, at west side of Point Anne Road.....	1922	545.1	25.9	8.4	5.3	.....	38.9	17.4	641.0	858
	1914	27.6	.....	.....	.....	.....	88.7	18.0	134.3	191
South of Cataraqui Corner....	1922	770.6	50.5	14.2	9.9	.1	103.9	55.8	1,005.0	1,341
	1914	62.8	2.3	.....	.....	.....	279.7	130.7	475.5	695

Port Hope-Belleville Road

August 30th to September 5th, 1922, inclusive; 6 a.m. to 10 p.m., Eastern Standard Time.

Location of Observer	Year	Passenger Automobiles	Light Motor Trucks	Heavy Motor Trucks	Motor Busses	Steam Engines and Lorries	1-Horse Vehicles	2-Horse Vehicles	Total Daily Average	Maximum for 1 day
Immediately east of Brighton Village.....	1922	484.1	15.2	.15	.4	.....	27.6	22.0	550.8	700
West of Belleville, opposite Lot 31, Con. 1, Sydney Township.	1922	792.9	54.4	18.9	8.7	1.1	77.6	75.2	1,048.8	1,380
	1914	67.0	1.3	.....	.....	.....	109.5	44.6	222.4	278

Belleville-Foxboro Road

August 30th to September 5th, 1922, inclusive; 6 a.m. to 10 p.m., Eastern Standard Time.

Location of Observer	Year	Passenger Automobiles	Light Motor Trucks	Heavy Motor Trucks	Motor Busses	Steam Engines and Lorries	1-Horse Vehicles	2-Horse Vehicles	Total Daily Average	Maximum for 1 day
North of Belleville, opposite Lot 4, Con. 2, Thurlow Township.	1922	257.9	13.2	9.7	.....	.1	62.4	55.7	399.0	539
	1914	45.8	.....	.....	.....	.....	95.0	30.7	171.5	320

Belleville-Picton Road

August 30th to September 5th, 1922, inclusive; 6 a.m. to 10 p.m., Eastern Standard Time.

Location of Observer	Year	Passenger Automobiles	Light Motor Trucks	Heavy Motor Trucks	Motor Busses	Steam Engines and Lorries	1-Horse Vehicles	2-Horse Vehicles	Total Daily Average	Maximum for 1 day
On Belleville Bay Bridge.....	1922	257.9	13.2	9.7	.4	.....	74.5	25.6	517.1	717

Port Hope-Peterboro Road

August 30th to September 5th, 1922, inclusive; 6 a.m. to 10 p.m., Eastern Standard Time.

Location of Observer	Year	Passenger Automobiles	Light Motor Trucks	Heavy Motor Trucks	Motor Busses	Steam Engines and Lorries	1-Horse Vehicles	2-Horse Vehicles	Total Daily Average	Maximum for 1 day
South of Peterboro, at Scott's Corners.....	1922	393.1	10.1	8.0	.1	.6	11.6	9.3	432.2	654
	1914	17.7	.....	.....	.....	.....	32.0	10.6	60.3	109
North of Port Hope, at south side Con. 3, Hope Township.....	1922	286.6	13.9	3.9	.6	.7	53.1	46.8	405.6	504

Toronto-Port Hope Road

August 30th to September 5th, 1922, inclusive; 6 a.m. to 10 p.m., Eastern Standard Time.

Location of Observer	Year	Passenger Automobiles	Light Motor Trucks	Heavy Motor Trucks	Motor Busses	Steam Engines and Lorries	1-Horse Vehicles	2-Horse Vehicles	Total Daily Average	Maximum for 1 day
West of Bowmanville at Cour- tice.....	1922	936.0	26.6	25.0	2.6	.6	46.9	22.4	1,060.1	1,380
West of Welcome.....	1922	707.3	17.1	6.4	1.0	.4	59.8	29.9	821.9	1,096
East of Toronto, intersection of Markham Road and Dan- forth Avenue.....	1922	4,125.9	297.9	130.8	91.3	.....	91.0	67.9	4,804.8	7,310
East side of Highland Creek..	1922	1,526.3	97.7	92.3	.....	.....	50.8	20.1	1,787.2	2,737
	1914	171.0	1.1	.....	.....	.....	64.6	13.7	253.4	411

Whitby-Lindsay Road

August 30th to September 5th, 1922, inclusive; 6 a.m. to 10 p.m., Eastern Standard Time.

Location of Observer	Year	Passenger Automobiles	Light Motor Trucks	Heavy Motor Trucks	Motor Busses	Steam Engines and Lorries	1-Horse Vehicles	2-Horse Vehicles	Total Daily Average	Maximum for 1 day
West of Lindsay, at east side, Cons. 3 and 4, Ops Township.	1922	189.5	4.0	3.3	.3	.2	26.0	45.0	268.3	334
Manchester Corner, south of Port Perry Road.....	1922	392.4	21.5	8.6	.....	.1	29.8	18.5	470.9	714
North of Whitby, at south side Cons. 2 and 3, North Whitby Township.....	1922	272.7	20.3	3.5	.....	.1	24.5	13.1	334.2	456

Toronto-Severn Road

August 30th to September 5th, 1922, inclusive; 6 a.m. to 10 p.m., Eastern Standard Time.

Location of Observer	Year	Passenger Automobiles	Light Motor Trucks	Heavy Motor Trucks	Motor Busses	Steam Engines and Lorries	1-Horse Vehicles	2-Horse Vehicles	Total Daily Average	Maximum for 1 day
Top of Holland Landing Hill....	1922	686.1	9.6	4.0	.1	.....	17.1	6.3	723.2	1,221
South of Barrie at south side, Con. 11 and 12, Innisfil Town- ship.....	1922	544.9	13.2	6.1	.7	.4	17.8	8.7	591.8	921
South limits, Town of Barrie...	1922	381.1	8.4	1.1	5.7	.3	27.4	25.4	439.4	618
South of Washago at south side of Sparrow Lake Road.....	1922	273.3	7.6	1.6	.....	.....	14.5	7.6	299.6	395
Opposite Thornhill Golf Club...	1922	1,333.9	89.9	28.1	.1	.1	21.7	16.5	1,490.3	2,408
	1914	239.2	10.2	.....	.....	.....	65.9	21.7	337.0	500

Toronto-Hamilton Road (Dundas Street)

August 30th to September 5th, 1922, inclusive; 6 a.m. to 10 p.m., Eastern Standard Time.

Location of Observer	Year	Passenger Automobiles	Light Motor Trucks	Heavy Motor Trucks	Motor Busses	Steam Engines and Lorries	1-Horse Vehicles	2-Horse Vehicles	Total Daily Average	Maximum for 1 day
*West of Bloor Street Inter- section.....	1922	1,576.4	64.8	19.5	29.6	.1	35.5	24.8	1,750.7	4,106
	1914	348.7	14.4	.....	.....	.....	167.9	80.1	611.1	910
Cooksville Corners.....	1922	851.4	80.1	62.8	.3	.....	36.8	32.0	1,063.4	1,785
	1914	311.8	12.4	.....	.....	.....	160.9	104.4	589.5	719

* Note: 1914 observing point at Islington P.O., 1 mile east of 1922 observing point.

Toronto and Hamilton Highway

August 30th to September 5th, 1922, inclusive; 6 a.m. to 10 p.m., Eastern Standard Time.

Location of Observer	Year	Passenger Automobiles	Light Motor Trucks	Heavy Motor Trucks	Motor Busses	Steam Engines and Lorries	1-Horse Vehicles	2-Horse Vehicles	Total Daily Average	Maximum for 1 day
100 ft. east of Long Branch Avenue.....	1922	7,501.3	328.3	230.5	77.4	11.3	47.6	40.0	8,236.4	12,296
	1914	159.4	14.4	.....	.....	.....	68.7	44.3	286.8	382
Opposite Starch Works, Port Credit.....	1922	5,848.7	307.6	141.3	77.9	.....	25.3	17.2	6,418.0	10,109
	1914	171.4	11.6	.....	.....	.....	158.7	58.3	400.0	520
East Oakville Limits.....	1922	4,793.9	181.5	91.8	48.7	.....	13.9	17.1	5,146.9	8,821
East of Bronte.....	1922	4,269.0	103.3	74.4	41.7	.1	4.0	3.3	4,495.8	7,942
Burlington.....	1922	4,735.3	252.6	91.3	45.4	.....	14.7	17.4	5,156.7	8,178
West of King's Road.....	1922	4,394.4	247.3	110.6	44.9	.....	22.4	30.6	4,840.2	7,265
	1914	105.4	3.0	.....	.....	.....	84.1	32.0	224.5	298
Intersection with New Hamil- ton Entrance.....	1922	5,376.9	330.3	128.4	60.9	.....	32.1	8.3	5,936.9	8,573

Port Credit-Owen Sound Road

August 30th to September 5th, 1922, inclusive; 6 a.m. to 10 p.m., Eastern Standard Time.

Location of Observer	Year	Passenger Automobiles	Light Motor Trucks	Heavy Motor Trucks	Motor Busses	Steam Engines and Lorries	1-Horse Vehicles	2-Horse Vehicles	Total Daily Average	Maximum for 1 day
South of Chatsworth, at north side Lot Line 14 and 15, Con. 2, Holland Township.....	1922	152.7	4.0	1.1	.....	.3	32.5	14.8	205.4	275
South of Flesherton, at north side Lot Line 160 and 161, Con. 1, East, Artemesia Township ...	1922	153.6	1.7	.7	.....	.....	51.4	11.2	218.6	419
North of Orangeville, at Lot Line 4 and 5, Con. 2, West, Mono Township.....	1922	191.1	5.0	1.0	.....	.4	28.9	26.7	253.1	334
North of Brampton, at south side Lot, Line 10 and 11, Con. 1, Chinguacousy Township.....	1922	702.0	72.0	50.9	.7	1.0	82.6	67.4	976.6	1,124

Hamilton-Guelph Road

August 30th to September 5th, 1922, inclusive; 6 a.m. to 10 p.m., Eastern Standard Time.

Location of Observer	Year	Passenger Automobiles	Light Motor Trucks	Heavy Motor Trucks	Motor Busses	Steam Engines and Lorries	1-Horse Vehicles	2-Horse Vehicles	Total Daily Average	Maximum for 1 day
North side of intersection with Con. 5 and 6, East Flamboro Township.....	1922 1914	516.6 33.9	30.3 0.4	10.7	12.1	.9	11.7 69.0	10.8 37.5	593.1 140.8	911 238
South of Guelph, at north side of Lot Line 6 and 7, Puslinch Township.....	1922 1914	872.4 37.3	49.5 2.3	10.0	15.9	.....	28.7 68.6	13.7 35.3	990.2 143.5	1,582 233

Guelph-Owen Sound Road

August 30th to September 5th, 1922, inclusive, 6 a.m. to 10 p.m., Eastern Standard Time.

Location of Observer	Year	Passenger Automobiles	Light Motor Trucks	Heavy Motor Trucks	Motor Busses	Steam Engines and Lorries	1-Horse Vehicles	2-Horse Vehicles	Total Daily Average	Maximum for 1 day
South of Owen Sound, at North Sydenham-Holland Townline.	1922 1914	206.7 13.3	6.8	5.6	.4	.4	30.2 39.0	12.2 12.1	298.3 64.4	377 76
South of Durham, at north side of Glenelg-Egremont Townline	1922	177.1	5.2	.1	.....	.3	35.9	8.7	227.3	293
South of Arthur, at north side Lot Line 18 and 19, Peel Town- ship.....	1922	227.1	8.3	3.4	.1	.4	69.4	36.6	345.3	433

Hamilton-Kitchener Road

August 30th to September 5th, 1922, inclusive; 6 a.m. to 10 p.m., Eastern Standard Time.

Location of Observer	Year	Passenger Automobiles	Light Motor Trucks	Heavy Motor Trucks	Motor Busses	Steam Engines and Lorries	1-Horse Vehicles	2-Horse Vehicles	Total Daily Average	Maximum for 1 day
Top of Dundas Mountain.....	1922 1914	840.3 49.6	37.3 2.1	76.8	8.6	1.4	89.2 159.9	30.1 63.4	1,083.7 275.0	1,603 441

Kitchener-Brampton Road

August 30th to September 5th, 1922, inclusive; 6 a.m. to 10 p.m., Eastern Standard Time.

Location of Observer	Year	Passenger Automobiles	Light Motor Trucks	Heavy Motor Trucks	Motor Busses	Steam Engines and Lorries	1-Horse Vehicles	2-Horse Vehicles	Total Daily Average	Maximum for 1 day
South-west of Brampton at west side Con. 1 and 2, West, Chin- guacousy Township.....	1922	427.9	15.4	13.0	.....	.4	15.5	4.4	476.6	735
East of Kitchener, at G.T.R. Crossing.....	1922	461.6	20.9	20.2	.3	.....	25.5	3.2	531.7	745
	1914	43.2	3.3	.....	.....	.....	75.4	16.0	137.9	240
North-east corner Lot 11, Con. 2, Guelph Township.....	1922	179.9	10.5	7.0	.3	.1	30.9	9.7	238.4	308
	1914	8.0	3.0	.....	.....	.....	37.8	8.5	54.6	86

Kitchener-Stratford Road

August 30th to September 5th, 1922, inclusive; 6 a.m. to 10 p.m., Eastern Standard Time.

Location of Observer	Year	Passenger Automobiles	Light Motor Trucks	Heavy Motor Trucks	Motor Busses	Steam Engines and Lorries	1-Horse Vehicles	2-Horse Vehicles	Total Daily Average	Maximum for 1 day
East of Stratford at Lot Line 35 and 36, North Easthope Town- ship.....	1922	137.9	6.0	3.5	.....	.3	22.4	8.0	178.1	228
	1914	36.8	0.3	.....	.....	.....	40.0	17.1	94.2	111
West of Kitchener at east side of New Dundee Road.....	1922	116.1	13.4	12.7	.3	.6	14.9	35.2	193.2	263
	1914	13.0	0.3	.....	.....	.....	66.6	19.7	99.6	250

Arthur-Kincardine Road

August 30th to September 5th, 1922, inclusive; 6 a.m. to 10 p.m., Eastern Standard Time.

Location of Observer	Year	Passenger Automobiles	Light Motor Trucks	Heavy Motor Trucks	Motor Busses	Steam Engines and Lorries	1-Horse Vehicles	2-Horse Vehicles	Total Daily Average	Maximum for 1 day
South of Kincardine, at west side of Lots 10 and 11, Kincardine Township.....	1922	92.0	3.8	2.0	.....	.1	8.0	34.2	140.1	258
Riversdale Village.....	1922	85.1	3.0	1.6	.....	.1	35.0	24.0	148.8	212
South limits of Clifford Village..	1922	226.0	12.4	.6	.6	.3	42.8	14.2	294.7	393
South limits of Harriston.....	1922	335.4	12.3	1.4	2.1	.1	83.1	32.3	466.7	654

Stratford-Goderich Road

August 30th to September 5th, 1922, inclusive; 6 a.m. to 10 p.m., Eastern Standard Time.

Location of Observer	Year	Passenger Automobiles	Light Motor Trucks	Heavy Motor Trucks	Motor Busses	Steam Engines and Lorries	1-Horse Vehicles	2-Horse Vehicles	Total Daily Average	Maximum for 1 day
South of Goderich, at north side Lot Line 5 and 6.....	1922	205.7	2.4	1.9	2.7	.....	73.9	20.7	307.3	400
South of Seaforth at Tucker- smith-Hibbert Town Line....	1922	185.3	7.0	3.4	7.4	.1	43.1	7.0	256.9	337
South side Lot Line 10 and 11, Ellice Township.....	1922	800.1	16.3	8.6	8.0	.....	43.2	12.3	888.5	1,493
	1914	63.5	0.6	.....	.....	.....	110.0	19.1	193.2	318

Stratford-London Road

August 30th to September 5th, 1922, inclusive; 6 a.m. to 10 p.m., Eastern Standard Time.

Location of Observer	Year	Passenger Automobiles	Light Motor Trucks	Heavy Motor Trucks	Motor Busses	Steam Engines and Lorries	1-Horse Vehicles	2-Horse Vehicles	Total Daily Average	Maximum for 1 day
North of London at south side Cons. 4 and 5, London Town- ship.....	1922	785.7	44.9	20.7	1.9	.....	59.2	28.1	940.5	1,324
	1914	51.2	2.1	.....	.....	.....	80.3	23.5	157.1	181
West of St. Marys, at G.T.R. Crossing.....	1922	267.3	13.2	8.0	.3	.3	58.4	24.8	372.3	465
Elginfield — Elginfield-London Traffic.....	1922	315.9	6.0	10.4	1.4	.....	15.7	9.8	359.2	588
Elginfield — Elginfield-Stratford Traffic.....	1922	40.7	.5	1.9	.....	.1	11.2	14.5	68.9	92
South of Stratford, at Cons. 3 and 4, Downie Township.....	1922	546.4	13.3	1.0	.....	.....	85.2	35.7	697.6	998
	1914	78.3	0.8	.....	.....	.....	173.5	53.5	306.1	393

Sarnia-London Road

August 30th to September 5th, 1922, inclusive, 6 a.m. to 10 p.m., Eastern Standard Time.

Location of Observer	Year	Passenger Automobiles	Light Motor Trucks	Heavy Motor Trucks	Motor Busses	Steam Engines and Lorries	1-Horse Vehicles	2-Horse Vehicles	Total Daily Average	Maximum for 1 day
West side of Lot Line 15 and 16, Sarnia Township.....	1922	857.4	17.2	7.1	1.9	.1	47.3	14.5	945.5	1,366
	1914	21.1	0.8	.....	.....	.....	65.6	44.6	132.1	209
Elginfield — Elginfield-Sarnia Traffic.....	1922	3.3	.1	.6	.....	.....	1.9	2.2	8.1	11

Hamilton-Queenston Road

August 30th to September 5th, 1922, inclusive; 6 a.m. to 10 p.m., Eastern Standard Time.

Location of Observer	Year	Passenger Automobiles	Light Motor Trucks	Heavy Motor Trucks	Motor Busses	Steam Engines and Lorries	1-Horse Vehicles	2-Horse Vehicles	Total Daily Average	Maximum for 1 day
Fruitland P.O.....	1922	2,607.7	93.0	55.0	1.1	.9	45.2	47.9	2,849.8	5,030
	1914	111.6	1.5	.....	.....	.....	45.0	30.9	189.0	253
West side of 30-Mile Creek...	1922	2,074.1	138.4	26.3	5.1	.....	41.3	32.9	2,318.1	4,040
Jordan Corner.....	1922	2,098.3	86.7	57.4	28.1	1.3	33.6	36.3	2,341.7	3,940
	1914	154.4	0.6	.....	.....	.....	75.9	46.9	277.8	471

Hamilton-Jarvis Road

August 30th to September 5th, 1922, inclusive, 6 a.m. to 10 p.m., Eastern Standard Time.

Location of Observer	Year	Passenger Automobiles	Light Motor Trucks	Heavy Motor Trucks	Motor Busses	Steam Engines and Lorries	1-Horse Vehicles	2-Horse Vehicles	Total Daily Average	Maximum for 1 day
Intersection with St. Thomas- Niagara Falls Rd.....	1922	195.6	18.6	1.9	7.3	.....	16.6	16.9	256.9	334
North side Con. 7 and 8, Barton Township.....	1922	525.4	49.0	40.6	25.3	1.6	59.7	36.9	739.5	900
	1914	40.5	1.4	.....	.....	.....	136.5	104.2	282.6	492

St. Thomas-Niagara Falls Road

August 30th to September 5th, 1922, inclusive; 6 a.m. to 10 p.m., Eastern Standard Time.

Location of Observer	Year	Passenger Automobiles	Light Motor Trucks	Heavy Motor Trucks	Motor Busses	Steam Engines and Lorries	1-Horse Vehicles	2-Horse Vehicles	Total Daily Average	Maximum for 1 day
Yarmouth Centre.....	1922	544.6	27.4	13.5	.3	.3	31.3	14.1	631.5	920
	1914	50.8	0.6	.....	.....	.....	99.4	26.1	176.9	274
Canboro Corner.....	1922	300.7	14.9	3.2	4.7	.3	16.0	14.0	353.8	489
Forks Road, Lots 21 and 22, Wainfleet Township.....	1922	329.4	26.7	6.0	4.7	.3	19.9	21.1	408.1	592
North of Welland, Canboro Road Intersection.....	1922	363.6	31.3	17.0	2.1	.7	11.3	6.7	432.7	677

Hamilton-London Road

August 30th to September 5th, 1922, inclusive; 6 a.m. to 10 p.m., Eastern Standard Time.

Location of Observer	Year	Passenger Automobiles	Light Motor Trucks	Heavy Motor Trucks	Motor Busses	Steam Engines and Lorries	1-Horse Vehicles	2-Horse Vehicles	Total Daily Average	Maximum for 1 day
West side of Crumlin Corners	1922	868.1	21.3	16.3	4.7	.3	19.0	5.6	935.3	1,304
	1914	86.2	1.7	.....	.....	.....	88.8	22.7	109.1	333
Beachville.....	1922	639.1	36.6	12.5	.....	.9	41.1	57.7	787.9	952
	1914	99.5	3.4	.....	.....	.....	118.4	38.0	259.3	323
East of Woodstock, at west side Lot Line 12 and 13, Bland- ford Township.....	1922	621.1	13.9	7.8	5.3	.6	51.5	13.4	704.6	940
	1914	57.4	2.6	.....	.....	.....	69.6	17.1	146.7	285
Cons. 1 and 2, Brantford Township.....	1922	411.1	40.6	10.0	1.4	.....	17.8	62.5	543.4	687
	1914	53.1	2.3	.....	.....	.....	27.8	11.0	94.2	124
Cainsville G.T.R. Crossing...	1922	1,424.9	54.9	16.9	25.3	.....	55.0	30.9	1,607.9	2,154
	1914	131.3	0.6	.....	.....	.....	191.5	65.4	388.8	578
Hamilton & Dundas Railway Crossing at west limits of Hamilton*.....	1922	2,667.9	174.5	89.9	78.3	.....	83.8	35.5	3,129.9	4,005
	1914	152.4	10.3	.....	.....	.....	210.6	110.2	483.5	666

*Note.—1914 observing point was located at Binkley's Corner, about $\frac{3}{4}$ mile west of 1922 observing point.

London-St. Thomas Road

August 30th to September 5th, 1922, inclusive; 6 a.m. to 10 p.m., Eastern Standard Time.

Location of Observer	Year	Passenger Automobiles	Light Motor Trucks	Heavy Motor Trucks	Motor Busses	Steam Engines and Lorries	1-Horse Vehicles	2-Horse Vehicles	Total Daily Average	Maximum for 1 day
Talbotville.....	1922	330.6	8.9	2.6	.3	.1	52.2	35.7	430.4	674
	1914	54.8	3.9	.....	.....	.....	70.5	26.1	155.3	292
Lambeth.....	1922	391.3	22.0	5.2	.6	.6	27.1	29.7	476.5	672
	1911	83.8	3.7	.....	.....	.....	123.5	39.8	250.8	305

Windsor-Talbotville Road

August 30th to September 5th, 1922, inclusive; 6 a.m. to 10 p.m., Eastern Standard Time.

Location of Observer	Year	Passenger Automobiles	Light Motor Trucks	Heavy Motor Trucks	Motor Busses	Steam Engines and Lorries	1-Horse Vehicles	2-Horse Vehicles	Total Daily Average	Maximum for 1 day
Jackson's Corners.....	1922	1,081.1	39.6	10.6	4.3	.6	28.4	21.1	1,185.7	1,966
	1914	99.1	3.2	.....	.....	.....	34.9	26.5	213.7	313
Maidstone.....	1922	606.7	30.2	5.3	.....	.1	29.0	14.7	686.0	1,178
Division Road south of Cottam	1922	668.1	45.0	5.3	.1	.4	9.6	16.8	735.3	1,420
Cedar Springs.....	1922	665.0	40.3	6.4	7.1	.1	16.7	12.4	948.0	1,178
Morpeth.....	1922	337.4	21.7	2.5	.....	.6	28.1	35.9	426.2	514
Wallacetown.....	1922	138.9	17.1	.9	.....	.6	34.4	44.7	236.6	277
Talbotville.....	1922	224.1	7.7	5.6	.....	.1	53.2	35.5	326.2	402

Lambeth-Maidstone Road

August 30th to September 5th, 1922, inclusive; 6 a.m. to 10 p.m., Eastern Standard Time.

Location of Observer	Year	Passenger Automobiles	Light Motor Trucks	Heavy Motor Trucks	Motor Busses	Steam Engines and Lorries	1-Horse Vehicles	2-Horse Vehicles	Total Daily Average	Maximum for 1 day
West of Chatham, at east side of Lot Line 12 and 13, Raleigh Township.....	1922	155.7	5.7	5.4	.6	.3	.7	6.8	181.5	286
East of Chatham, at west side Lot Line 6 and 7, Chatham Township.....	1922	209.0	12.1	5.6	.....	.3	14.9	8.1	250.9	424
	1914	15.5	0.1	.....	.....	.....	38.5	14.5	60.2	105
Wardsville, east side of road to Ridgetown.....	1922	586.9	17.0	10.3	.1	.1	70.9	47.0	732.3	930
Maidstone.....	1922	329.6	13.3	1.3	.....	.....	18.1	6.8	369.1	802
Lambeth.....	1922	909.6	35.5	12.8	3.0	.1	46.3	19.0	1,026.3	1,231
	1914	37.7	2.3	58.6	10.5	115.1	170

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Pub. No.	Title.
	Annual Reports.
	Annual Proceedings, Ontario Good Roads Association.
9.	Report of the Ontario Highways Commission, 1914.
10.	Regulations respecting Township Road Superintendents, 1916.
11.	Regulations respecting County Roads, 1920.
14.	Township Road Improvement, 1918.
15.	The Motor Vehicles Act, The Highway Travel Act, The Load of Vehicles Act, The Public Vehicles Act, 1920.
16.	General Specifications for Concrete Highway Bridges, 1920.
17.	General Specifications for Steel Highway Bridges, 1917.
18.	Highway Bridges, 1917.
19.	General Plans for Steel Highway Bridges, 1917.
20.	Description of Road Models Exhibit, 1917.
21.	Short Forms for Bridge Tenders, 1917.
22.	Report on Street Improvement, 1917.
23.	Bituminous Surfaces for Macadam Roads, 1917.
24.	Specifications for Bituminous Materials, 1917.
25.	County Road Legislation, as enacted by The Highway Improvement Act, The Ontario Highways Act, and The Obstructions on Highways Removal Act, 1920.
27.	Widening the Provincial Highway, 1919.
28.	Main Road Legislation, 1919.
29.	Regulations respecting Township Roads, 1920.
30.	Township Road Legislation, as enacted by The Ontario Highways Act, 1920.
31.	Motor Vehicle Headlamps.
32.	Report of Committee on Road Accounting.
33.	The Provincial Highway Act, 1922.
34.	The Planting and Care of Roadside Trees, 1923.
35.	The Public Vehicles Act, 1923.

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ONTARIO

1923, 1924, 1925

PRINTED BY ORDER OF
THE LEGISLATIVE ASSEMBLY OF ONTARIO



ONTARIO

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TO HIS HONOUR HENRY COCKSHUTT,
Lieutenant-Governor of the Province of Ontario.

MAY IT PLEASE YOUR HONOUR:

I herewith beg to present for your consideration the Report of the Department of Public Highways, relating to Highway Improvement in the Province of Ontario during the years 1923, 1924, and 1925.

Respectfully submitted,

GEO. S. HENRY,
Minister of Public Works and Highways.

TO THE HONOURABLE GEO. S. HENRY,
Minister of Public Works and Highways,
Ontario.

Sir,—I have the honour to submit the Report of the Department of Public Highways for the years 1923, 1924, and 1925, having special reference to works on the Provincial Highway System; work carried on by the several counties of Ontario, and by township councils.

Reference is also made to the operation of the Motor Vehicles Act; and to other services within the purview of the Department of Public Highways.

I have the honour to be, Sir,

Yours respectfully,

S. L. SQUIRE,
Deputy Minister of Highways.

Parliament Buildings, Toronto, April 26th, 1926.



Bituminous penetration pavement near Holland Landing on Toronto-Severn Provincial Highway.

Highway Improvement in Ontario

Report by S. L. Squire, Deputy Minister

The present era is remarkable as one of rapid and convenient travel, transportation and communication. In this it is distinguished from all preceding ages. Invention has shown more marked advance in this phase of modern civilization than in any other. Every refinement has been sought, and vast expenditures have been made on steam and electric railways, ocean and lake steamship lines, harbours and canals, telephone, telegraph and cable and wireless services. All these have not lessened but rather have increased the need for better highways, and the demands for their improvement are accumulating with marked intensity. The motor vehicle has become a necessity for the transaction of business.

There are, in the nature of things, more restrictions on the social activities of those who live in the rural districts than on those who live in towns, due to the distances the residents must travel if any considerable number are to meet together.

In the smaller towns, social life is more or less dependent upon the participation of those who live in the surrounding farming community and anything that prevents the country people from joining with the town in social affairs is a deterrent to a healthy community intercourse. A certain amount of social intercourse is a necessity to all people and in rural communities it is particularly salutary to the health and happiness of the people that reasonable opportunities be presented for social gatherings. If our highways are well kept and comfortable to travel at all seasons of the year, that will do much to encourage frequent social gatherings and the whole life of the community will respond to the interchange of ideas and experience that will thus be obtained.

Highway improvement also has an important bearing on the educational opportunities of the children who live in the country. They should have as good an opportunity for education as offered to children in the towns, and, indeed, the solution of the problem of furnishing an adequate supply of food stuffs to the nation depends upon the proper education of the children in the rural communities.

While the various social and educational aspects of the rural highway problem are of great importance, they are less so than is the transportation phase. Highways must be considered as important links in the transportation system of this Dominion and as such it is vital that they be maintained in usable condition throughout the year. In some communities serviceable roads may be nothing more than well kept earth roads; others may furnish traffic requiring a gravel or stone road, or roads of a higher degree of durability such as cement concrete or asphaltic concrete. No matter which may be required, our highways are a part of the equipment for the transaction of business and any reasonable expenditure of money in road improvement is justifiable as a matter of enlightened public policy.

From social, educational and transportation standpoints, then, it is apparent that money expended for highway improvement is a good investment. Such

an expenditure, however, should be made only after a careful study of the factors that will have a bearing on the adequacy of the resulting road system. Haphazard expenditures can never produce results of commensurate value.

Our highways are now utilized for both business and pleasure purposes by great numbers of citizens and assume an importance that has rapidly increased these past few years.

A few years ago the traffic on our highways was purely local, but with their improvement as necessitated by the advent of the motor car, a large number have now to take care of through motor car traffic and of commercial motor truck and bus traffic. The latter two classes of traffic appear to have no limitations as to distance travelled and will greatly increase in volume as the condition of our highways are improved.



Concrete pavement, Provincial Highway, Paris to Brantford.

With the development of the motor car and truck traffic, the condition of these thoroughfares became of more than local interest, resulting in the concentration of authority in the county, rather than in the township, while finally, the Province had to step in and assume authority in the administration of our heavily travelled highways.

The trend of highway legislation in Ontario therefore has been toward a three-fold classification and which has been evolved in the following manner:

(1) LOCAL OR TOWNSHIP ROADS, each carrying the traffic, or little more than the traffic, which is created by the farms adjoining the road; such roads controlled by and at the expense of township councils, aided by a Provincial subsidy of 30 per cent. on the expenditure made on road improvement and 50 per cent. on the salary of a road superintendent.

(2) COUNTY ROADS, being the market or intercounty roads, such roads are controlled by and at the expense of the county councils, aided by a Provincial subsidy of 50 per cent.

(3) PROVINCIAL HIGHWAYS, being the roads between important cities and other terminal points, under the control of the Department of Public Highways of the Province toward the cost of which the Province pays 80 per cent., the remaining 20 per cent. being a charge against the county. Adjacent to cities, the cost is borne in the proportion of 60 per cent. by the Province, 20 per cent. by the county and 20 per cent. by the city.

Road improvement in the Province during the past three years has been systematically carried out, with the result that at the end of 1925 a large additional mileage of improved roads of all types has been completed. Not only was a substantial programme of construction on the Provincial Highway System carried out, but the work of townships and counties on the roads under their respective jurisdiction was marked by improvement in the quality of the work. While there is still room for improvement in some counties, the work has indicated that the municipalities have a clearer conception than before of the relationship between cost and actual results as well as the difference between a temporary job and a lasting improvement.

The mileage of roads with respect to classification, in that part of the Province under county organization is now as follows:

Provincial Highways (ordinary).....	1,506.3	miles
Provincial Suburban Highways.....	355.0	"
<hr/>		
Total Provincial Highways.....	1,861.3	"
County Roads (ordinary)...	7,285.7	"
County Suburban Roads	693.3	"
<hr/>		
Total County Roads	7,979.0	"
Township Roads.....	43,959.0	"
Other Roads (Special Commissions).....	51.0	"
<hr/>		

Total mileage of roads in the organized

Counties..... 51,989.0 miles

The investment which is being made in our highways systems is annually mounting and will, if continued, reach a total greater than for any other public work. That this investment is justified from economic and national viewpoints most citizens agree.

The annual increased investment in motor cars and the maintenance bill on these affords an economic problem worthy of the consideration of all Ontario citizens who are interested in finance.

Road construction and maintenance affords a problem which challenges the thought of the engineer, the contractor and the tax payer. Ontario's roads in their present improved condition are saving the road user at least twice their entire cost annually. Experiments have been made and records kept of operating costs of motor cars on unimproved roads and improved highways. The State of Kentucky places the saving in car operation at two-and-a-half cents per mile.

If two-thirds of Ontario's motor mileage is made on improved highways (experts claim 80 per cent. is made on these roads) the annual summer saving would be at least \$20,000,000 on the basis of present use.

This government believes that they are the custodians of economic responsibility of the taxpayer and in view of the marked savings effected, consider they

have been acting in the interest of all Ontario citizens by pursuing an active progressive road building policy.

The problem of making the roads safe has been given careful consideration. Their improvement and the increased use made of them by the growing number of motorists makes the possibility of accidents much greater.

This department is responsible for the policing of the highways and employs a special corps of officers for this purpose. The chief purpose of such policing is to make the highways safe, to check reckless driving and to assist motorists who may need assistance or direction. Their work is to popularize the use of the road, rather than penalize the user. "Making Ontario Highways Safe" is a Departmental slogan, and the fact that for the past three years there have



Concrete pavement north of Puslinch on Hamilton-Guelph Provincial Highway.

been less motor accidents on Ontario roads in proportion to use than on the roads of any other province or state on this continent speaks eloquently for the policy adopted.

The tourist finds much in Ontario to attract him and with the completion of a further mileage of improved roads, more and more tourists will be found using them.

Some time when making a summer trip on Ontario's roads check up the number of cars bearing foreign license plates. Last year more than 2,000,000 American cars used Ontario's roads.

Improved farms, freshly painted homes, neatly kept front lawns, paved streets in our towns and villages—these and much more can be credited to the progressive highway policy pursued by the Highway Department under the supervision of the Honourable Mr. Henry, Minister of Public Works and Highways.

Report on Municipal Roads

Report upon the work of the Municipal Roads Branch for the
years 1923, 1924 and 1925

ROBT. C. MUIR, Engineer of Municipal Roads.

COUNTY ROADS

Provincial aid to counties on road improvement is given through County Road Systems, under the Highway Improvement Act.

The Highway Improvement Act was initiated in 1901, when an appropriation of one million dollars was made by the Provincial Government with a view to aiding the construction of county roads; the Provincial subsidy being 33⅓ per cent.

The Highway Improvement Act has for several years been in a stage of transition with respect to subsidies due to the changing character of traffic on our roads, to their growing importance, and the consequent need for a re-



A clear vision is essential at curves on all county roads.

adjustment of road laws, with the result that the Province to-day is paying 50 per cent. of the expenditure made on county roads. Laws require certain experimental periods in which to fully develop them to meet all needs and conditions. Ontario has received a gratifying measure of success in this regard.

Since the passing of the Highway Improvement Act, and to the end of 1925, a total of \$66,102,641.89 has been expended on construction and maintenance of county roads, of which the Province has contributed \$29,359,266.82. This includes the county expenditure of 1925, on which the Provincial subsidy was paid in 1926.

A system of county roads has been established in each of the thirty-seven counties of the Province, although there are a few instances where only the more densely populated section of a county is included in the County Road System.

The length of the County Road System at the end of 1925 amounted to approximately 7,979 miles, being about 15.3 per cent. of the total road mileage in the area covered by the County Road Systems involved.

The following table shows the mileage of the various types of road surfacing laid, and the bridges built on the County Road System to the end of 1925:—

Gravel.....	5,691 miles.
Waterbound Macadam.....	1,756 “
Bituminous Macadam.....	202 “
Cement Concrete.....	151 “
Asphaltic Concrete.....	57 “
Brick.....	2 “

Total.....7,859 miles.

Bridges over 10-foot span.....	1,943
Concrete slab culverts.....	4,089

Probably the most noticeable feature in county road work within the past few years over the early stages of the system has been the construction of a substantial mileage of the more permanent types of surface, such as bituminous macadam, asphaltic concrete, and cement concrete. In many counties there are certain roads on which traffic has increased in volume to such an extent that maintenance costs of gravel and stone roads have reached a point where economy necessitates the use of surfaces which entail a greater initial expenditure, but which, on account of the better service rendered, will prove more economical in the end. With the exception of the counties of York, Waterloo, and Wentworth, which had laid approximately 10 miles of pavement, no permanent paving was done prior to 1918.

In addition to constructing permanent pavements, many counties have devoted much attention to grade reduction, and to the elimination of dangerous corners and railway crossings, and many miles of original grade have been widened to meet the demands of present day traffic. The majority of the timber bridges and culverts are now replaced with more permanent structures. Approximately 130 permanent bridges and 300 concrete slab culverts have been erected, and 2,700 pipe culverts of various sizes have been laid annually during the past few years on the County Road System. In addition, approximately 1,400 miles of gravel and macadam roads have been re-surfaced annually and maintained in good condition.

Public Safety on Highways

Our highways are intended for the travelling public and every reasonable means should be used to ensure safe passage over them. The better the pavement the more important it is to give attention to the safety of the travelling public, for the better pavement will naturally occasion a higher speed; hence the more dangerous will become any defects in the road itself, such as ruts along the shoulder. There is also a greater necessity for clearer vision at road and railway crossings.

Maintenance

As will be observed from the appendices to this report, that a large percentage of the expenditure on county roads is for maintenance; and rightly so—unless there be ample provision for the protection of the investment made in previously constructed roads (deterioration of which is inevitable under the drastic effects of present day traffic), it would be unwise for counties to continue constructing roads. But most counties are looking carefully to

this important problem of maintenance, giving it first consideration. When funds for upkeep have been suitably provided, any surplus moneys are applied to the work of further construction.

Road Accounting

With a view to establishing a uniform system of keeping road accounts, the Department has prepared and supplied suitable forms to the municipalities and is co-operating to the fullest extent with the municipal officials in creating a satisfactory system. It is essential that proper records be kept of the expenditures in order to build up an efficient organization. The services of the staff are at the disposal of the municipal officials at all times.



A county road of gravel construction well maintained.

Methods of Carrying on Work

Prior to 1925, the work on the county roads in a few counties was carried out by the township organization, that is, each township established a little system of county roads of its own. The expenditure within that township was met through the county books entirely by the local municipality irrespective of what other townships were doing. This manner of conducting county road operations was permitted in the early days of county road work as a stepping stone to sounder principles of management and better-balanced administrations. In these counties working on the township system, the arrangement was little more than a combination of loose parts trying to function on a business basis without working in unison or to any set purpose. Naturally there was little progress under such conditions, and as years elapsed it was difficult to see much actual road improvement, although considerable sums of money were being expended annually.

During the year 1925, County Road Systems throughout the Province underwent a certain amount of revision and standardization. All counties are now working together on a more uniform system of county road financing and administration and management, and are conducting their road affairs on an economical, business-like, and progressive basis.

Revision of County Road System

During 1925 the county road mileages have been revised and co-ordinated. Roads which served local traffic, largely, and which were not of sufficient importance to be retained under county jurisdiction were reverted to the townships in order that they might receive local supervision and care. As county roads many of them had received very little attention. Other roads which, for some unknown reason, had been overlooked, although carrying a considerable volume of traffic but could not be classed as local, were added to the system.

By means of systematized traffic studies, and by numerous sittings of the Highways' Advisory Committee in many centres throughout the Province, a clearer knowledge than previously had been possessed, was acquired of the importance of intercounty communication and of the relationship between each county system and its neighbouring system.

Maps were prepared setting forth what appeared to be the concensus of opinion as to what roads should be considered of more than local importance. The maps were submitted to the county councils and, before adoption, all changes and departures from the old system were thoroughly investigated and discussed.

The result is a more practicable, a more systematic and a more homologous system of secondary roads throughout the Province than has ever before been selected and established to undertake the gigantic problem of maximum service to traffic at minimum cost.

County Road Committee

A feture of recent legislation is the limiting the size of the county road committee appointed by the county council to not more than five members. This provision has as its aim an improvement in the efficiency of these advisory and administrative bodies. Where a county road committee consisted, as many of them did in the past, of a dozen or fifteen members, or perhaps of the entire county council, it was much too unwieldy to be of any material service to the county. The most able and efficient county road committees that we have had in the Province consist of three members only, and it is felt that a membership of three is quite adequate. But, having regard for the size and extensive mileage of roads of some counties the upper limit has been placed at five.

County Aid to Urban Municipalities

Prior to the 1924 legislation, county aid to urban municipalities not separated from the county was a mater of negotiation between the urban municipality and the county, with the result that some counties treated the local municipalities more generously than did other counties. The 1924 and 1925 legislation places all municipalities on the same basis, and now the county assumes the cost of the central 20-foot strip of roadway through urban municipalities not separated from the county on streets which are connecting links of the County Road System. The cost of the excess width over 20 feet and other special work must be borne by the urban municipalities. Provision is also made whereby the county must refund to the urban municipality, in the case of a town 50 per cent. of the amount

the town pays into the county for county road purposes and in the case of a village 75 per cent. The Province contributes 50 per cent. of the expenditure made by the county in or to the urban municipality.

1923 Expenditure

The expenditure on the County Road System in 1923 was as follows:—

Construction	Total Expenditure	Provincial Grant
Provincial County Roads.....	\$1,738,563.67	\$1,043,138.23
County Roads	3,542,086.84	1,416,834.70
Total Construction.....	\$5,280,650.51	\$2,459,972.93
Maintenance		
Provincial County Roads.....	\$ 547,031.77	\$ 328,219.05
County Roads.....	1,575,827.68	630,331.09
Total Maintenance.....	\$2,122,859.45	\$ 958,550.14
Summary		
Total Construction.....	\$5,280,650.51	\$2,459,972.93
Total Maintenance.....	2,122,859.45	958,550.14
Total Expenditure.....	\$7,403,509.96	\$3,418,523.07

The work on which the foregoing expenditures for construction were made included the following:—

Grading.....	607.30 miles
Gravel.....	274.04 miles
Waterbound macadam.....	175.58 "
Cement concrete.....	23.50 "
Bituminous macadam.....	27.36 "
Asphaltic concrete.....	16.72 "
Total surfaced.....	517.20 miles
Bridges over 10-foot span.....	180
Concrete slab culverts.....	414
Pipe and tile culverts.....	2,217
Tile underdrains.....	10,988 rods

1924 Expenditure

The expenditure on the County Road System in 1924 was as follows:—

Construction	Total Expenditure	Provincial Grant
Provincial County Roads.....	\$1,687,890.75	\$1,014,734.47
County Roads.....	2,886,808.47	1,154,724.38
Total Construction.....	\$4,574,699.22	\$2,169,458.85
Maintenance		
Provincial County Roads.....	\$ 660,808.61	\$ 394,485.16
County Roads.....	1,625,943.79	650,377.49
Total Maintenance.....	\$2,286,752.40	\$1,044,862.65
Summary		
Total Construction.....	\$4,574,699.22	\$2,169,458.85
Total Maintenance.....	2,286,752.40	1,044,862.65
Total Expenditure.....	\$6,861,451.62	\$3,214,321.50

The work on which the foregoing expenditures for construction were made included the following:—

Grading.....	523.55 miles
Gravel.....	344.85 miles
Waterbound macadam.....	184.76 "
Cement concrete.....	24.49 "
Bituminous macadam.....	27.24 "
Asphaltic Concrete.....	10.72 "
Total surfaced.....	592.06 miles

Bridges over 10-foot span.....	104
Concrete slab culverts.....	297
Pipe and tile culverts.....	1,781
Tile underdrains.....	7,590 rods

1925 Expenditure

In 1925, legislation was passed establishing one class of county roads, and providing for a straight Provincial subsidy of 50 per cent.

The expenditure on the County Road System in 1925 was as follows:—

Construction	Total Expenditure	Provincial Grant
County Roads.....	\$4,559,736.39	\$2,230,580.79
Maintenance		
County Roads.....	\$2,048,694.65	\$ 992,097.31
Total Expenditure.....	\$6,608,431.04	\$3,222,678.10

During the year 1925, it was deemed advisable to revise the County Road System throughout the Province, with the result that certain roads were struck off the system. On many of these roads struck off the system the county had made an expenditure towards which the Province contributed 40 per cent. and which is included in the above expenditures.

The work on which the foregoing expenditures for construction were made included the following:—

Grading.....	537.80 miles
Gravel.....	365.08 miles
Waterbound macadam.....	201.71 "
Cement concrete.....	21.81 "
Bituminous macadam.....	22.77 "
Asphaltic concrete.....	15.92 "
Total surfaced.....	627.29 miles

Bridges over 10-foot span.....	129
Concrete slab culverts.....	301
Pipe and tile culverts.....	1,696

Among the special features of road improvement effected during the year (1925) the following works may be mentioned.

BRANT COUNTY

Grade reduction and widening of a hill south of the village of Oakland on the Mount Pleasant Road. The material was handled by steam shovel and large cuts and borrow pits were required to make the fill. The nature of the soil was such as to require rip-rapping of the ditches.

BRUCE COUNTY

Bridge construction was a chief feature in 1925, and included the following: one 50-foot span, two 80-foot spans, two 24-foot spans and two 14-foot span bridges, all of reinforced concrete construction.

The road surfacing work consisted of gravelling thirty-eight miles of road, crushed gravel being used and applied twelve to sixteen feet in width for a depth of three to six inches. The roads were graded to a width of 26 feet prior to the laying of the gravel.

CARLETON COUNTY

The Fitzroy Bridge consisting of two 105-foot spans and 20-foot roadway was completed. The design is concrete abutments with steel superstructure. One 38-foot span concrete bridge with 18-foot road was also constructed. In addition, 12.5 miles of gravel roads were constructed, varying



BRANT COUNTY

County Road under construction. Cobblestone gutter built to protect shoulder.

in width from nine to eighteen feet with a depth of four to ten inches and laid on a grade twenty-four to twenty-eight feet in width.

ESSEX COUNTY

Nine miles of cement concrete pavements 18 feet wide were laid; four miles of which were laid on Division Road, being the road running northerly from the town of Kingsville and connecting with the Provincial Highway; four miles on the Windsor-Amherstburg Road, northerly from the town of Amherstburg; and one mile on the Tecumseh Road, easterly from the village of Belle River.

Approximately fifteen miles of road were graded to a width of 28 feet and two and a half miles of road gravelled.

GREY COUNTY

Approximately ten miles of gravel roads were constructed varying in length from one mile to four and a half miles, eighteen feet in width and eight inches in depth. In addition, approximately thirteen miles of road were graded to a width of 28 feet. Also, two sixty-foot span and three twenty-foot span concrete bridges were built.

HALDIMAND COUNTY

Approximately 39 miles of stone road were constructed to a width of 10 feet and six to eight inches in depth and four miles of road graded to a width of 24 feet. In addition two 16-foot concrete slab bridges 28 feet wide were built.

HURON COUNTY

Fourteen miles of road were graded to a width of 28 feet, and approximately 13 miles of road gravelled to a width of 20 feet at a depth of three to ten inches. In addition, one 25-foot span, four 20-foot span, and four 14-foot span concrete bridges were built, varying in width from 28 to 40 feet.

KENT COUNTY

On the Chatham-Wallaceburg Road, nine miles of road were graded to a width of 28 feet and surfaced with gravel 16 feet in width at a depth of five inches. This provides a safe and comfortable road for travel between the two mentioned towns at all seasons of the year.

Concrete pavement construction 18 feet wide consisted of three miles on the Chatham-Charing Cross Road and short stretches in the urban municipalities of Wallaceburg and Ridgetown.

The completion of Prairie Siding Bridge at a cost of \$114,442.82. This is the largest undertaking of this nature in this part of the Province and consists of a bascule double-leaf lift span, 115 feet centre to centre of trunnions, two approach spans of 158 feet and 98 feet. The roadway is 18 feet clear and the lift span is electrically operated. The total length of the bridge is 379 feet.

LAMBERTON COUNTY

The Pinery Bridge consisting of one 150-foot span with concrete abutments and steel superstructure was completed at a cost of \$22,308.07. In addition, two 24-foot spans and one 18-foot span bridges of concrete and steel design were built. Also approximately eight miles of road were graded to a width of 26 feet and approximately 12 miles of road surfaced with stone and gravel 12 feet in width.

LANARK COUNTY

Four miles of bituminous macadam road 16 feet wide were constructed, asphalt being used as a binder. In addition, approximately 9.25 miles of road were graded to a width of 28 feet, and 2.75 miles of waterbound macadam road laid 16 feet wide.

The Dalhousie Lake Bridge consisting of two 106-foot spans, with 18-foot roadway, was completed at a cost of \$24,029.62.

LEEDS AND GRENVILLE COUNTY

The county constructed 0.56 miles of concrete pavement, 18 feet wide, in the village of Kemptville at a cost of \$12,902.70.

In addition, 9.70 miles of road were graded to a width of 24 feet, and 8.75 miles of ten-foot waterbound macadam road were built and surface treated with asphaltic oil.

One 54-foot span and one 30-foot span bridge of concrete and steel design were built.

LINCOLN COUNTY

One 70-foot span and one 30-foot span bridge of concrete and steel design were built.

The work throughout the county consisted chiefly in general maintenance for the most part treating the existing macadam roads with asphalt.



HURON COUNTY
A well built and maintained gravel road.

NORFOLK COUNTY

Approximately 16 miles of road were graded to a width of 24 feet and eighteen miles of road were gravelled to a width of 14 feet. In addition, one 30-foot span and one 18-foot bridge of reinforced concrete construction were built.

ONTARIO COUNTY

Nine miles of road were graded to a width varying from 24 to 28 feet. In addition, two 40-foot and one 12-foot span bridges of reinforced concrete construction were built.

OXFORD COUNTY

Approximately 21 miles of road were graded to a width of 24 feet and thirty miles gravelled to a width of 15 feet. In addition, one 26-foot reinforced concrete bridge was built.

PEEL COUNTY

Eighteen miles of road were graded to a width of 24 feet and gravelled to a width of 12 feet. In addition one 32-foot span, two 20-foot span and five 14-foot span bridges of reinforced concrete construction were built.

PRINCE EDWARD COUNTY

Six miles of road were graded to a width of 24 feet and 5.50 miles of water-bound macadam road built and surface treated with oil.

PRESCOTT AND RUSSELL

Forty-two miles of road were graded to a width varying from 24 to 28 feet and 25 miles surfaced with waterbound macadam ten to fourteen feet in width.

RENFREW COUNTY

Fourteen miles of road were graded to a width of 24 feet and surfaced with gravel 10 to 16 feet wide. In addition, one 33-foot span and one 18-foot span bridges of reinforced concrete construction were built.

SIMCOE COUNTY

One 80-foot span steel truss bridge, 16-foot roadway, was built. Also seven bridges varying in span from 15 to 40 feet with 20-foot roadway of concrete design were built. In addition, 12 miles of road were graded to a width of twenty-four feet and 15 miles gravelled eighteen feet wide.

STORMONT, DUNDAS AND GLENGARRY

Two miles of bituminous macadam surface 16 feet wide were built, asphalt being used as a binder; also one-half mile of amiesite surface was laid in Winchester village. In addition, 25 miles of waterbound macadam and nine miles of gravel road, 10 to 16 feet wide, were laid. Two bridges of reinforced concrete construction, one 16-foot and one 20-foot span were built.

VICTORIA COUNTY

One-half mile of asphalt concrete surface 20 feet wide was laid in the hamlet of Little Britain. In addition, 5.15 miles of road were graded to a width of 28 feet and surfaced with gravel 16 feet in width. Three 20-foot span bridges of reinforced concrete construction, 24 to 28 feet wide, were built.

WATERLOO COUNTY

Three and one-half miles of concrete pavement, eighteen feet wide, were laid and 9.60 miles of road graded to a width of 30 feet.

WELLAND COUNTY

Four miles of road were graded to a width of 24 feet and surfaced with water-bound macadam ten feet wide. In addition, paving of an extensive nature was commenced in the villages of Fort Erie and Chippawa, toward the cost of which the county purposed contributing \$90,000.

WELLINGTON COUNTY

A little over one mile of concrete pavement 20 feet wide was laid, 0.90 of which was laid in the hamlet of Hillsburg. In addition, \$76,772.57 was paid to the urban municipalities of Harriston, Arthur, and Fergus for work done on connecting links of the County Road System within these municipalities. The nature of the work being a concrete pavement in the case of the first two mentioned municipalities and a concrete base with an asphaltic concrete top in Fergus.

Bridge construction consisted of two 20-foot span and five smaller span bridges with 20 to 26 feet roadway.

WENTWORTH COUNTY

Twelve miles of road were graded to a width of 24 to 28 feet and ten miles of waterbound macadam surface laid 12 to 16 feet wide, together with 5 concrete slab culverts and 17 pipe culverts. In addition, two 14-foot concrete slab bridges were built.



WENTWORTH COUNTY
Ten-foot cement concrete pavement with 3-foot cold mix shoulders.

GENERAL

The work in the remaining counties and other work of the abovenamed counties consisted chiefly in reshaping and maintaining the existing roads, building concrete box and pipe culverts and otherwise preparing for future work.

COUNTY ROAD MILEAGE AND EXPENDITURE

From inception of County Road Systems up to December 31st, 1925,
Provincial Subsidies on 1925 expenditure being paid in 1926.

COUNTY	Year of Estab- lish- ment of System	Road Mileages			Total Approved Expenditure to end of 1925	Total Government Grant
		County Roads	CountySub- urban Roads	Total		
Brant.....	1917	79.4	23.1	102.5	1,186,978.29	585,624.74
Bruce.....	1917	304.0	....	304.0	1,309,680.94	644,857.19
Carleton.....	1909	153.0	68.0	221.0	4,302,276.11	1,944,060.36
Dufferin.....	1918	130.0	....	130.0	640,602.54	285,982.30
Elgin.....	1917	203.8	20.2	224.0	1,276,131.78	562,351.48
Essex.....	1916	174.0	45.0	219.0	2,939,652.90	1,414,333.88
Frontenac.....	1907	107.5	39.5	147.0	800,780.55	334,381.25
Grey.....	1918	221.5	45.5	267.0	1,796,627.15	876,710.60
Haldimand.....	1911	126.0	....	126.0	1,379,147.62	588,431.09
Halton.....	1907	118.5	....	118.5	1,507,471.64	660,715.09
Hastings.....	1904	374.7	5.3	380.0	1,798,612.99	772,165.95
Huron.....	1917	362.0	....	362.0	1,284,994.33	579,231.89
Kent.....	1917	215.0	12.0	227.0	2,129,338.24	1,061,119.82
Lambton.....	1918	247.0	8.0	255.0	1,216,044.44	559,024.59
Lanark.....	1903	202.5	6.5	209.0	1,499,933.00	672,052.76
Leeds and Grenville.....	1910	307.0	4.0	311.0	1,565,229.56	635,907.44
Lennox and Addington.....	1906	126.0	....	126.0	836,719.88	373,085.90
Lincoln.....	1904	133.8	12.2	146.0	2,489,115.41	981,370.85
Middlesex.....	1906	383.0	28.0	411.0	2,051,527.54	841,604.97
Norfolk.....	1917	207.0	....	207.0	1,580,942.72	704,909.16
Northumberland and Durham.....	1918	256.0	....	256.0	867,820.55	405,624.57
Ontario.....	1918	195.7	8.3	204.0	835,423.05	384,077.51
Oxford.....	1904-7	221.0	....	221.0	1,598,742.18	626,672.81
Peel.....	1906	130.0	....	130.0	1,278,536.84	501,384.47
Perth.....	1907	178.0	....	178.0	866,823.57	348,451.92
Peterboro.....	1919	140.5	34.5	175.0	339,716.49	146,109.15
Prescott and Russell.....	1917	180.0	....	180.0	3,222,271.82	1,383,800.85
Prince Edward.....	1907	102.0	....	102.0	937,412.81	379,728.62
Renfrew.....	1918	193.0	....	193.0	2,146,405.22	1,031,597.60
Sincoe.....	1903	306.0	....	306.0	2,184,151.42	937,619.92
Storront, Dundas and Glengarry.....	1917	336.0	....	336.0	3,570,779.80	1,711,880.17
Victoria.....	1917	172.5	....	172.5	1,066,798.53	523,232.64
Waterloo.....	1908	145.2	19.8	165.0	1,565,330.98	736,066.59
Welland.....	1912	135.3	10.2	145.5	2,693,559.76	1,167,428.07
Wellington.....	1903	286.5	13.5	300.0	1,934,532.86	840,749.85
Wentworth.....	1902	132.3	27.7	160.0	2,196,425.66	913,577.00
York.....	1911	....	262.0	262.0	5,206,102.72	2,243,343.77
Totals.....		7,285.7	693.3	7,979.0	66,102,641.89	29,359,266.82

SUBURBAN ROADS

The motor vehicle has become a necessity for transaction of business. The increased use of our roads means their increased usefulness. The possible service that may be performed by the road is in proportion to the efficiency of the vehicle. The motor car and motor truck have greatly advanced the general public value of the road; and, whereas, good roads were regarded a few years ago as solely of rural concern, urban centres have become keenly alive to their value and are willing to bear a fair proportion of the cost. Instead of the farming population being expected to meet the entire cost, it is now fully con-

ceded that as regards main roads, cities and separated towns must share the burden with any other department of transportation or traffic. Cities benefit by rural trade induced, by tourist traffic; by the commercial and industrial traffic between cities.

Provision is made under the Highway Improvement Act whereby a city or separated town may co-operate with the county council in improving the leading county roads adjacent to the city or separated town and thereby obtaining a more substantial type of construction for such suburban road.

The section of county road designated as "Suburban" remains a county road, for which the county is responsible; the work of construction and maintenance is carried on under the direction of an engineer, appointed by the Suburban Road Commission, or may be carried on under direction of the County Road Superintendent, but subject to the instructions of the commission.

At the end of 1925, twenty cities of the twenty-two within the organized counties and one separate town, Smith's Falls, were paying towards the improvement of County Suburban Roads. The commissions appointed have assumed 693.3 miles of road, the expenditure on which at the end of 1925 amounted to \$10,916,202, of which the cities and separated towns have contributed \$2,950,180, or 4.46% of the total expenditure made on the County Road Systems.

Towards the expenditure on construction and maintenance, and supervision of County Suburban Roads, the Province contributes 50 per cent. and the county and city each 25 per cent. The object of a city's contribution is not to relieve the county of the expenditure which they are equitably called upon to make, but rather to improve the standard of roads radiating from the city, and to permit them to be maintained in a condition suited to the traffic over them. Traffic accumulates on the main roads immediately adjacent to the city, and it becomes an unfair charge upon rural districts to construct and maintain roads suited to such accumulated traffic.

The two cities which have not yet contributed towards the cost of improvement of county roads are Stratford and Woodstock, but it is expected that these cities will co-operate with the counties in the near future in improving the leading roads adjacent to the city.

In 1925 the expenditure on County Suburban Roads was \$1,415,390.61, of which the Province contributed \$701,949.57, and county and city each \$356,720.52.

Many of the commissions have adopted the principle of building permanent pavements, others again are re-shaping, widening and strengthening the existing roadway with the view of laying a permanent surface in the near future.

The main features of construction work carried out on County Suburban Roads during 1925 are as follows:—

TORONTO AND YORK ROADS COMMISSION

Approximately forty-five miles of road were graded to a width of twenty-six feet. The road surfacing consisted of approximately 13 miles of water-bound macadam, 5 miles of gravel, 10 miles of bituminous macadam, one third of a mile of concrete, 10½ miles of asphaltic concrete on cement concrete base, varying in width from 16 to 20 feet. In addition, one 33-foot span concrete bridge, 76 feet wide, work on which was commenced in 1924, was completed, also one 45-foot span concrete bridge, 20-foot roadway, and one 12-foot and one 17-foot span bridges were built. The 12-foot span bridge was 120 feet wide in order to care for a heavy fill.

OTTAWA SUBURBAN ROADS COMMISSION

The commission constructed 3.2 miles of bituminous macadam surface, 16 to 20 feet in width, also nine-tenths of a mile of asphaltic concrete surface on a concrete base, 20 feet wide, and 1.5 miles of gravel surface 16 feet wide. In addition, 2.5 miles of right of way were widened from 40 feet to 66 feet. The approaches to the Jock River Bridge in the village of Richmond were widened and dry stone retaining walls built and a new wooden floor laid and the steel of bridge painted. This work eliminated one of the most dangerous spots in the vicinity.

HAMILTON SUBURBAN ROADS COMMISSION

One mile of cement concrete pavement, 20 feet wide and one and one-half miles of bituminous macadam surface 18 feet wide were built. In addition, 3 miles of waterbound macadam road, 15 feet wide, were built.



OTTAWA SUBURBAN ROADS COMMISSION

Twenty-foot asphaltic concrete pavement with 2 feet penetration shoulder.

LONDON SUBURBAN ROADS COMMISSION

Three and one-fifth miles of concrete pavement were built on the Hyde Park Highway. The type of construction was two 10-foot strips of concrete with a 7-foot strip of gravel in the centre thus providing a travelled surface of 27 feet. This type of construction is called "Twin trail."

BELLEVILLE SUBURBAN ROADS COMMISSION

An amiesite surface $2\frac{1}{2}$ inches deep and 18 feet wide for a length of $3\frac{1}{8}$ miles was laid on the Corbyville Road, approximately 2.75 miles being laid on a 5-inch concrete base, the remainder being on a macadam base.

OWEN SOUND SUBURBAN ROAD COMMISSION

Approximately eight miles of gravel road 18 feet wide were constructed, together with one 12-foot span reinforced concrete bridge with a 20-foot roadway.

GUELPH SUBURBAN ROADS COMMISSION

Fourteen hundred feet of concrete pavement 20 feet wide was laid in addition to approximately one mile of gravel road, 16 feet wide.

NIAGARA FALLS ROADS COMMISSION

Eight hundred and fifteen feet of asphaltic concrete surface on macadam base was laid at a special road intersection.

SMITHS FALLS SUBURBAN ROADS COMMISSION

Two miles of bituminous macadam surface 16 feet wide was constructed on a macadam base, asphalt being used as a binder.

GENERAL

The work on suburban roads has shown remarkable improvement during the past few years, and the commissions in the majority of instances are to be commended on the method of carrying on the work.

The construction of permanent pavements and structures on suburban roads in the close vicinity of the city should be encouraged by all Suburban Roads Commission.

TOWNSHIP ROADS

The township road plays a most important part in the development of this Province and the improvement of such roads must not be overlooked.

Our township roads, in the early history of the Province, depended largely on Statute Labour for improvement; this system having been created by the first parliament of the Province (then Upper Canada) in 1796. Money expenditure, raised by general levy on the township assessment, has been, however, steadily increasing and at the end of 1925, 282 townships had abolished Statute Labour.

There are 418 organized townships within the organized counties of the Province with a road mileage of approximately 40,000 miles under the control of the township councils. At the end of 1925 approximately 19,000 miles had been surfaced with gravel or stone.

STATUTE LABOUR

In the old days, when traffic moved slowly on a narrow strip of gravel, statute labour served its purpose. Statute Labour is suited to a pioneer age, but with the advent of the motor car it has become obsolete as a road builder. Statute labour still holds in some localities but is growing weaker.

The defects of statute labour may be briefly outlined as follows:

Responsibility is too much divided. No one can be held directly responsible for the condition of the roads, nor for the proper expenditure of money and labour upon them. Work is done at one time of the year only, the remainder of the year the roads are neglected and repairs not made when needed. Work done by statute labour is not done at points where most needed. No matter how urgently grading or ditching is needed, if it is more convenient for the farmer to haul gravel, he does so. The wishes of the man who is to do the work, not the work itself, are the first consideration. Some men give a full day's work, others pay the commutation rate of \$1.50 per day. Others again, give a part

of a day's work, and in some townships methods are so lax that they can escape without giving either labour or money. We all know the troubles of the pathmaster, his friends and his foes—the disregard for his instructions. There is always a liability of ill-feeling between the pathmaster and his neighbours if he demands even a reasonable performance of their statute labour.

Good methods of road improvement cannot be expected, as pathmasters do not retain their office long enough to become experts. Again, with so many pathmasters as are generally appointed, and the annual system of rotation, uniformity is impossible. Work cannot be carried on continuously from year to year, in pursuance of a well-defined plan, so that improvements are now made which have little or no connection with one another. In short, statute labour has prevented townships from carrying out a consistent, economical plan of road improvement.



AN EXAMPLE OF THE RESULTS OF STATUTE LABOUR GRADING
Soil and sods graded over a consolidated gravel roadbed.

In 1924 it was found that the average cost of applying gravel on the road by statute labour was \$1.05 per yard-mile as against 35 cents per yard-mile by contract or day labour. That is, to get \$5.00 worth of work done by statute labour, the townships consumed \$15.00 worth of statute labour necessary to do it. More than one million dollars worth of sturdy township energy was wasted each year in performing statute labour on the roads of this Province, that is the commuted value in dollars and cents—on the basis of a full day's work, a full wagon box—gravel placed exactly where it is needed and spread as it should be spread.

TOWNSHIP ROAD SUPERINTENDENTS

The government of the day quick to recognize the necessity of placing the improvement of township roads on a business basis, and to meet the above essentials, made provisions in the Highways Act, 1915, whereby the Province would contribute \$150 annually to townships which appointed a township road superintendent.

In 1920, a further and more generous amendment was made in the Highways Act, which amendment provided that the Province would contribute 20 per cent on the expenditure made on road improvement and 40 per cent. of the salary of the road superintendent, the appointment of the superintendent being optional with the township council.

In 1920, 172 townships took advantage of the Provincial aid, spending on road improvement \$1,631,460 and receiving subsidies aggregating \$326,292. Of this number of townships 88 appointed superintendents and paid in salaries the sum of \$36,767 of which the Province paid \$14,707. In 1921, 294 townships met the requirements of the Act of which 143 appointed road superintendents. In 1922, 312 townships took advantage of Provincial aid of which 143 appointed superintendents, while in 1923, 315 townships took Provincial aid, of which 152 appointed superintendents. In 1924, 320 accepted aid and 163 Townships appointed superintendents.



AN EXAMPLE OF THE RESULTS OF STATUTE LABOUR GRAVELLING

Traffic has in six months developed a new roadway in order to avoid the work performed.

The advent of the motor car and more rapid transportation on our highways has emphasized in no uncertain terms the necessity of change from statute labour. The application of a heavy coat of gravel every few years is not only costly, but it is far from adequate. Our roads now need constant and efficient care. Proper drainage, safe width and uniformity of surface are absolutely essential if we are to employ the motor vehicle as a safe, comfortable, durable and economical means of transportation. A poorly kept road means loss of time, high wear and tear, discomfort and danger to life. How does the statute labour system take care of the above essentials?

An examination of the statute labour system, from the standpoint of business organization, shows clearly that it is not a sound basis for permanent road development. Good organization is the first step towards good roads. Until townships abolish statute labour, the creation of an efficient organization will be delayed. Efficient organization has two main features:—

(1) *Expenditure to be wholly on a cash basis*, instead of statute labour, the money to be raised by a rate on the general township assessment, in the same way as other township revenue.

(2) *Management to be placed under one permanent road superintendent* for the township, acting under the direction of the council.

These two features permit the application to road improvement of principles that are essential to success in any local business undertaking. The first merely does away with the existing system of statute labour. The second is the all-important factor of the system to be put in its place. Responsibility should be definitely centralized in one manager so that there is a strong incentive for him to obtain the best results and to avoid mistakes. This is obtained by having one superintendent in place of twenty or more overseers of statute labour.

In carrying out the system under one superintendent, it is apparent that success must largely depend on the choice of a man for road superintendent.



AN EXAMPLE OF THE RESULTS OF THE ABOLITION OF STATUTE LABOUR
This township road can be used during all seasons.

That is true in any business. If an inefficient man is selected and there is a complete failure the first year it does not mean that statute labour should be retained, but merely that the council should appoint a better superintendent. At the same time too much must not be expected of an inexperienced superintendent for the first year. In placing responsibility on him for results, he must be given corresponding authority especially in the matter of hiring or discharging of men and teams. The council should decide the work to be done, but the doing of the work should be left in the hands of the superintendent.

A good road superintendent can, as time goes on, make a complete study of the local road situation, the relative importance of the various roads, the grading, drainage and bridging required on each, and the location of gravel or stone. With this knowledge, he can be a most valuable guide to succeeding councils just as a township clerk is in other matters.

The Department has watched with interest and concern the careful expenditure of money, the wise balancing of road operations, the judicious handling of men, machinery and materials, and the steady improvement of the roads during the past few years in those townships where there had been an official whose job it is to see that the various undertakings are carried out in the quickest, safest and most economical way, and as a result the Department is thoroughly convinced that unless there is such an official in a township to take charge of the operations decided upon by the township council, there can be no assurance of efficiency of methods or economy in expenditure, and there can be no longer any subsidies paid to townships where these essentials of management are not assured.

After the most serious consideration and with the intention of assisting the townships on road improvement to the fullest extent, the present administration provided, at the 1924 session of the Legislature, further aid to townships and whereby the Province will contribute *30 per cent. on the expenditure made by the township on road improvement* and *50 per cent. of the salary and expenses of a township road superintendent*. To entitle the township to the mentioned subsidies, the township must (1) abolish statute labour by by-law, and (2) appoint a township road superintendent.

The decision is the result of careful survey of the whole Province covering a period of years. It is simply a vindication of the old law of management—centuries old. *All management implies three things: an object, a force, and a director of that force to accomplish that object.* Applied to township road work, the object is the economical upkeep and improvement of the roads to meet the demands which the traffic of to-day makes upon them. The force consists of public money, machinery, and brains. The director of that force is the *township road superintendent*.

Another important matter that must be considered by the township is the adoption of some definite plan of road improvement extending over a period of years towards which the program of each year's road development will definitely tend.

The Province is going to be fair to all as regards Statute Labour, all townships will be placed on the same basis. It demands uniformity among the townships who seek its aid.

From the above we will observe that the tendency has been on the part of the Government to encourage the townships to place the expenditures on road improvement under the control and supervision of one manager acting under the direction of the township council.

CLASS OF WORK

The class or standard of work to be done on township roads will be governed largely by the amount of traffic using the roads. The importance of the roads will decide as to the amount of expenditure and the type of construction required on the work. The Department desires to co-operate to the fullest extent with the townships in the improvement of township roads, and the requests that the townships communicate with the Department before any permanent work is commenced. The engineers of the Department are at the services of the townships at all times in this as in other road matters.

The following shows the growth of Provincial aid to townships on road improvement, under the provisions of the Ontario Highways Act.

1916.....	\$1,241.71	towards superintendent's salary
1917.....	\$1,608.72	“ “ “
1918.....	\$1,910.59	“ “ “
1919.....	\$2,620.60	“ “ “
1920.....	\$340,973.38	Commencement of aid on road improvement
1921.....	\$708,486.91	
1922.....	\$649,601.48	
1923.....	\$614,037.88	
1924.....	\$638,940.11	
1925.....	\$988,633.29	
Total.....	\$3,948,054.67	

1925 WORK

On December 31st, 1925, 278 townships had passed the necessary by-laws to entitle them to the Provincial subsidies on expenditure made in 1925. This is approximately 67 per cent. of the townships within the organized counties or 87 per cent. of the townships taking aid in 1924.

In 1925, 162 bridges and 531 concrete box culverts were built by the townships and numerous pipe culverts laid. Yearly the mileage of earth roads is diminishing, gravel, stone or other more substantial surface being employed to provide the farmer with a safe and convenient road in seasons of the year when he needs it most.

As in previous years, work on the township roads consisted chiefly of renewing wornout surfaces and keeping them smooth by the frequent dragging—that is, expenditures were largely for maintenance. It is to be noted that the old timber type of bridge and culvert is steadily giving way to permanent concrete structures of ample width to safely accommodate all present and probably future traffic as regards strength, durability and width of passage. Narrow grades are being widened out, swampy stretches cleared and drained, and effective watercourses established along road sides to ensure a reliable road surface in all weathers.

In bridge construction the most notable features were the Millard Bridge, Amabel township, which consisted of three concrete beam spans of 35 feet each. East Williams township, one 93-foot span with two shore spans of 30 feet each of steel and concrete design. One 98-foot span, steel truss was built in Fullarton township and one 123-foot span, steel truss in Winchester township.

The main objective of every township council should be to provide the farmer with a safe and convenient road in seasons of the year when he needs it most.

PROVINCIAL RESPONSIBILITY

The Province has undertaken its responsibility as regards road development in a number of ways:—

1. By a thorough study of traffic and transportation problems in all civilized countries of the world with a view to adapting the best available knowledge and practice to our own local conditions and problems. These are at the disposal of every rural community in the Province, and at their service also is a force of carefully trained road engineers—practical men, experienced in sizing up any local peculiarities and applying thereto the most practicable and economical solutions known to the science.

2. By insisting on the adoption of reliable records of money expenditure in all phases of road work. This is a matter which we have found to be very much in need of improvement and standardization. Some appalling statements are frequently circulated throughout communities, or the Province generally, concerning the cost of our roads—statements that are erroneous and misleading to such a degree that not only the ratepayers but often municipal officials themselves do not know whether to believe them or not. The ratepayer must be informed officially of the actual and incontrovertible truth respecting the portion of his taxes that is spent upon his roads. On county work in some counties we have succeeded well in the establishment of a simple, lucid and accurate accounting of all expenditures. Much has still to be accomplished, however, before our ratepayers can point with satisfaction and understanding to the results of his financial interest in the road activities in his county and township.

3. By dispensing guidance in the matter of construction of roads and bridges and the adequate maintenance of existing thoroughfares, the Province is not only safeguarding its own financial interests in the problem of transportation but that of the smallest communities as well. Standard types and plans for the smaller structures are supplied gratis and our engineers are untiring in their endeavours to encourage an adherence to these standards in the interests of reliability and economy.

4. By discountenancing ill-advised and unsound practice in actual workmanship and methods, our engineers are effecting for the counties and townships savings that will be best reckoned in added years of service rather than in dollars of expenditure.

5. We have encouraged the appointment of township road superintendents realizing full well that only in a centralized control of municipal matters can the greatest economy be effected and results obtained commensurable with the cost.

6. With this end in view, also, we have encouraged the abolition of the Statute labour system. The best argument against this system of road work is the condition of the roads themselves. It is proven to be wasteful of effort and not the system that responds to the demands of present day traffic.

APPENDICES

Nos. 1 to 13

APPENDIX

SUMMARY,

Statement of Work and Expendi

County	Work Done During Year							Roads and Culverts
	Miles Graded	Miles Stoned	Miles Gravelled	Tile Drain Rods	Bridges	Pipe and Tile Culverts	Other Culverts	
Brant.....	3.00	Bit. Mac. 0.28	3.00	34	...	12	...	\$ c. 13,794 23
Bruce.....	19.24	2.75	22.00	...	5	91	18	48,427 09
Carleton.....	35.02	Asp. Con. 3.52 Bit. Mac. 9.20	22.00	71	3	89	21	357,232 96
Dufferin.....	2.75	...	1.50	...	2	43	1	13,792 29
Elgin.....	5.60	1.17	4.43	1,188	1	35	2	25,088 37
Essex.....	16.48	Concrete 3.23	11.75	...	3	25	6	131,967 25
Frontenac.....	6.00	6.00	...	...	1	24	6	20,407 52
Grey.....	12.00	4.19 Concrete... 1.50	5.00	...	8	8	4	75,159 19
Haldimand.....	9.50	...	...	...	2	58	1	7,037 22
Halton.....	7.00	0.75	2.00	...	1	17	3	6,137 15
Hastings.....	7.80	3.40	4.30	...	5	8	11	21,199 68
Huron.....	19.50	...	16.00	...	6	...	3	48,244 57
Kent.....	0.87	0.87	...	939	4	12	4	6,855 60
Lambton.....	4.25	3.00	1.25	...	9	4	9	13,154 20
Lanark.....	9.75	9.75	...	...	2	21	1	20,427 26
Leeds and Grenville.....	12.40	11.65	1.50	...	1	14	1	48,293 06
Lennox and Addington.....	0.27	3.00	0.05	...	3	1	2	41,707 32
Lincoln.....	15.79	8.40 Concrete 1.56 Bit. Mac. 0.16	...	34	...	252	...	10,474 99
Middlesex.....	19.57	Concrete 1.79	13.16	513	7	53	10	145,936 07
Norfolk.....	15.87	...	...	187	...	50	2	95,608 74
Northumberland and Durham.....	5.17	...	8.48	30	5	50	3	43,838 45
Ontario.....	18.97	1.60	1.50	8	6	105	21	18,071 75
Oxford.....	13.72	Bit. Mac. 0.08	16.72	3,290	5	19	...	38,270 05
Peel.....	11.49	...	12.49	...	5	58	1	4,680 24
Perth.....	0.39	0.39	...	936	...	12	...	56,621 15
Peterborough.....	1.14	...	1.14	...	1	5	3	57,674 70
Prescott and Russell.....	38.28	20.78	9.25	...	6	57	14	7,205 68
Prince Edward.....	0.43	...	0.06	...	1	1	...	10,851 18
Renfrew.....	17.59	4.28	17.06	23	4	35	31	10,242 05
Simcoe.....	9.00	3.00	5.75	...	7	49	7	234,493 53
Stormont, Dundas and Glengarry...	13.47	13.55 Bit. Mac. 0.35	...	...	10	11	25	1,236 14
Victoria.....	3.06	1.20	2.34	...	2	49	4	145,973 24
Waterloo.....	7.38	1.19	...	...	1	15	4	44,150 29
Welland.....	9.50	Concrete 0.19	6.00	...	1	12	7	132,809 69
Wellington.....	...	...	...	45	5	...	5	28,091 72
Wentworth.....	13.28	6.66 Bit. Mac. 0.87	...	36	3	97	3	32,812 36
York.....	39.50	19.07 Asp. Con. 5.00 Bit. Mac. 9.70	2.90	37	1	117	10	34,930 04
Totals.....	425.03	*164.08	191.63	7,371	126	1,509	243	7,530 48

*Includes:—
Waterbound macadam.....126.65 miles
Concrete.....8.27 "
Bituminous Macadam.....20.64 "
Asphaltic Concrete.....8.52 "

No. 1

1923

ture on County Road Construction

Approved Expenditure for Year

Bridges	Machinery and Repairs	Special Grants to Towns and Villages	Purchase of Toll Roads and Gravel Pits	Super- intendence	Approved Expenditure on Con- struction	Approved Expenditure on Main- tenance	Total Approved Expenditure	Government Grant 40%
\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
12,220 16	7,313 98 6,493 14	5,422 12		3,914 47 4,599 29	25,022 68 77,161 80	17,244 04 24,420 10	42,266 72 101,581 90	16,906 69 40,632 76
10,958 26	18,243 37			10,458 92	396,893 51	54,069 43	450,962 94	180,385 17
3,023 77	2,032 09			2,648 90	21,497 05	21,890 34	43,387 39	17,354 96
38,039 17	3,312 13	8,666 08		3,251 36	78,357 11	72,444 96	150,802 07	60,320 83
4,388 82	1,878 68	6,000 00		4,692 97	148,927 72	60,091 47	209,019 19	83,607 68
696 00	3,768 81			1,998 16	26,870 49	19,588 97	46,459 46	18,583 78
27,859 10	2,085 17	7,403 50		3,175 65	115,682 61	35,823 36	151,505 97	60,602 39
2,739 91	1,157 53			3,006 73	13,941 39	45,407 75	59,349 14	23,739 66
1,227 25	2,625 21			2,035 25	12,024 86	17,627 17	29,652 03	11,860 81
12,578 86	5,361 54	7,847 94		4,785 09	51,773 11	51,539 18	103,312 29	41,324 92
7,665 53	10,718 53	14,146 86	450 00	4,783 55	86,009 04	56,888 17	142,897 21	57,158 88
22,344 93	14,047 88	1,887 03		3,781 42	6,855 60 55,215 46	67,980 52	6,855 60 123,195 98	2,742 24 49,278 39
32,550 40	8,573 57	10,389 39		3,318 96	75,259 58	63,956 41	139,215 99	55,686 39
2,710 85	8,226 18			2,779 18	62,009 27	18,116 70	80,125 97	32,050 39
2,137 38	4,995 60	7,604 80		3,375 56	59,820 66	47,277 33	107,097 99	42,839 19
11,910 04	3,311 43	7,782 28		2,137 60	35,616 34	11,826 38	47,442 72	18,977 09
23 44	3,860 10			6,578 09	156,397 70	50,431 50	206,829 20	82,731 68
1,425 80	4,517 37			4,452 69	1,425 80	62,111 09	1,425 80	570 32
42,482 86					147,061 66		209,172 75	83,669 10
420 05	3,838 94	5,700 00		3,692 45	57,489 89	75,375 47	132,865 36	53,146 14
6,845 07	9,580 61	11,536 13		4,124 80	50,158 36	20,073 63	70,231 99	28,092 79
6,246 51	3,689 91	8,370 39	430 93	4,155 15	61,162 94	26,415 14	87,578 08	35,031 23
14,849 00	7,717 45			2,782 98	4,680 24	31,795 53	4,680 24	1,872 10
14,319 44	2,055 44			3,005 96	81,970 58	30,544 90	113,766 11	45,506 44
582 50				1,404 00	77,055 54	45,378 97	107,600 44	43,040 18
4,134 83	899 55			2,397 45	9,192 18	28,335 91	54,571 15	21,828 46
60,706 02	3,176 01	1,500 00	675 00	3,505 86	18,283 01		46,618 92	18,647 57
1,254 46	4,870 44	2,000 00		2,215 08	10,242 05	48,296 86	10,242 05	4,096 82
29,994 53	3,306 00	6,500 00		5,393 20	304,056 42	19,334 64	352,353 28	140,941 31
1,936 60					11,576 12	17,719 39	30,910 76	12,364 30
12,641 10	2,147 99	7,972 32		4,234 00	191,166 97		208,886 36	83,554 54
12,610 60	7,359 11	1,650 00		4,975 98	1,936 60	62,886 92	1,936 60	774 64
5,766 73	11,105 48	13,689 71		4,934 83	71,145 70		134,032 62	53,613 05
1,200 00	16,489 39	7,029 06		3,381 65	159,405 38	59,761 19	219,166 57	87,666 63
16,894 24	5,179 15	5,782 96		3,907 25	63,588 47	22,725 32	86,313 79	34,525 52
15,195 68	2,262 42			3,128 75	60,912 46	39,585 75	100,498 21	40,199 28
16,257 73	4,048 10			6,213 33	66,693 64	65,812 04	132,505 68	53,002 27
2,344 88	3,722 63			6,955 82	28,117 33	74,006 93	102,124 26	40,849 70
					92,384 42	61,122 23	153,506 65	61,402 66
					467,045 10	47,921 99	514,967 09	205,986 84
461,159 06	200,134 27	152,740 67	1,555 93	146,182 38	3,542,086 84	1,575,827 68	5,117,914 52	2,047,165 79

APPENDIX

SUMMARY,

Schedule of Expenditure on Maintenance

For the period beginning January 1st,

County	Grading		Culverts		Re-surfacing		Dragging		Oiling or Tarring	
	\$	c.	\$	c.	\$	c.	\$	c.	\$	c.
Brant.....	881	50	76	30	13,296	18	1,740	95	.....	.....
Bruce.....	2,054	78	608	23	13,737	59	2,081	46	.....	.....
Carleton.....	1,438	07	182	68	33,959	29	671	04	10,531	29
Dufferin.....	4,142	43	218	05	14,308	08	1,459	09	.....	.....
Elgin.....	5,886	24	929	46	55,326	97	5,207	95	.....	.....
Essex.....	379	08	95	21	47,527	89	10,088	55	126	67
Frontenac.....	2,764	75	514	20	14,239	41	29	90	369	01
Grey.....	653	51	1,253	49	26,587	67	3,307	55	1,205	14
Haldimand.....	1,620	20	709	08	35,977	44	4,648	19	.....	.....
Halton.....	423	50	271	43	15,634	82	1,004	38	.....	.....
Hastings.....	6,354	67	3,055	05	34,489	89	1,282	57	2,883	91
Huron.....	4,586	97	4,043	25	31,866	21	3,428	51	4,208	22
Kent.....	3,538	50	496	19	49,938	63	9,148	41	480	78
Lambton.....	8,821	36	1,573	29	46,680	15	6,148	54	239	51
Lanark.....	4,577	65	648	75	9,537	19	307	25	372	68
Leeds and Grenville.....	1,694	06	1,683	71	40,251	98	329	40	1,129	83
Lennox and Addington.....	1,029	07	488	98	9,065	97	23	00	.....	.....
Lincoln.....	570	70	2,033	08	24,413	49	3,803	75	14,631	13
Middlesex.....	1,046	38	516	35	39,029	71	10,823	33	3,138	68
Norfolk.....	11,590	51	278	39	59,226	43	2,083	04	36	68
Northumberland and Durham	830	75	509	72	10,193	27	4,410	52	367	86
Ontario.....	2,965	32	356	87	16,541	42	1,969	09	671	11
Oxford.....	1,057	92	2,246	07	23,329	47	1,874	54	.....	.....
Peel.....	5,175	76	369	00	18,873	78	2,065	48	1,831	72
Perth.....	2,600	78	351	61	34,027	77	1,484	67	5,326	07
Peterborough.....	7,636	35	773	59	14,739	33	.....	.....	.....	.....
Prescott and Russell.....	6,514	09	284	65	685	23	1,111	24	38,272	84
Prince Edward.....	956	05	242	41	14,558	04	19	75	2,126	53
Renfrew.....	3,277	26	1,235	92	5,992	31	1,296	18	4,369	89
Simcoe.....	3,459	27	391	73	49,385	82	1,770	95	200	95
Stormont, Dundas and Glen-	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
garry.....	740	70	659	19	30,067	28	1,397	90	22,869	37
Victoria.....	2,217	44	326	04	14,084	00	1,569	28	711	70
Waterloo.....	2,624	23	75	94	32,517	07	1,578	34	157	05
Welland.....	1,234	64	100	28	60,319	36	361	45	3,180	00
Wellington.....	11,573	96	5,680	95	43,108	13	9,504	04	473	81
Wentworth.....	13,423	75	6,156	71	33,796	98	3,503	27	4,241	52
York.....	1,275	22	.....	.....	18,951	71	1,474	20	16,368	08
Totals.....	131,617	42	39,435	85	1,036,265	96	103,007	76	140,522	03

No. 2

1923

and Repair on County Roads

1923, and ending December 31st, 1923.

Snow Shovelling	Bridges	Ditching and Draining	Cutting Weeds and Brush	Wire Fence Bonus	Total Expenditure	Total Government Grant, 40%
\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
183 05	760 56	78 70	226 80		17,244 04	6,897 62
1,295 86	4,431 91		210 27		24,420 10	9,768 04
3,786 45	1,204 17	1,793 53	502 91		54,069 43	21,627 77
1,045 35	229 59	487 75			21,890 34	8,756 14
724 14	2,842 41	340 13	1,187 66		72,444 96	28,977 98
31 45	100 72	1,359 42	382 48		60,091 47	24,036 59
520 45	205 32		234 69	711 24	19,588 97	7,835 59
2,750 63	65 37				35,823 36	14,329 34
124 80	1,586 39		741 65		45,407 75	18,163 10
212 05	80 99				17,627 17	7,050 87
868 00	2,293 64		311 45		51,539 18	20,615 67
3,593 06	3,981 54	450 45	729 96		56,888 17	22,755 27
148 12	879 28	1,434 03	709 45	ferry 1,207 13	67,980 52	27,192 21
	32 00		461 56		63,956 41	25,582 56
505 25	1,023 60			1,144 33	18,116 70	7,246 68
73 75	2,102 60			12 00	47,277 33	18,910 93
958 81	127 55			133 00	11,826 38	4,730 55
695 53	7 00	4,276 82			50,431 50	20,172 60
1,040 04	3,276 56	1,573 64	1,666 40		62,111 09	24,844 44
292 29	1,283 14	45 96	539 03		75,375 47	30,150 19
2,251 96	637 79	535 11	336 65		20,073 63	8,029 45
2,268 10	330 94		652 55	659 74	26,415 14	10,566 06
912 99	948 07	602 99	578 65	244 83	31,795 53	12,718 21
1,247 35	819 93		161 88		30,544 90	12,217 96
1,160 21	427 86				45,378 97	18,151 59
989 76	3,509 24	239 00	445 34	3 30	28,335 91	11,334 37
1,304 41	124 40				48,296 86	19,318 75
945 95	485 91				19,334 64	7,733 86
296 30	959 30		292 23		17,719 39	7,087 76
2,471 03	3,679 60			1,527 57	62,886 92	25,154 77
1,574 12	1,640 87		811 76		59,761 19	23,904 48
862 36	155 59		1,679 81	1,119 10	22,725 32	9,090 13
677 35	1,955 77				39,585 75	15,834 30
141 50	14 36		460 45		65,812 04	26,324 81
2,584 62	252 04			829 38	74,006 93	29,602 77
					61,122 23	24,448 89
8,435 08	1,417 70				47,921 99	19,168 79
46,972 17	43,873 71	13,217 53	13,323 63	7,591 62	1,575,827 68	630,331 09

APPENDIX

SUMMARY,

Statement of Work and Expenditure

County	Work Done During Year						
	Miles Graded	Miles Stoned	Miles Gravelled	Tile Drain Rods	Bridges	Pipe and Tile Culverts	Other Culverts
Brant.....	4.75			187	1	14	1
Bruce.....	31.72		35.00		9	107	12
Carleton.....	4.20	Asp. Con. 2.20 Bit. Mac. 3.00	2.00	185		23	
Dufferin.....	5.20		3.40		2	37	1
Elgin.....	0.25		0.25	178		2	2
Essex.....	17.60	Concrete 6.53		1,876	1	14	9
Frontenac.....	0.25					1	
Grey.....	7.50		6.00				12
Haldimand.....			1.12		1	1	3
Halton.....			1.12				1
Hastings.....	8.10	2.30	5.70		3	29	3
Huron.....	2.00		2.00		3	1	2
Kent.....	2.03	Concrete 1.98		370	5	6	4
Lambton.....	1.75		1.75		2	4	5
Lanark.....	2.93	2.93			1	36	2
Leeds and Grenville.....	3.00	3.00					
Lennox and Addington.....	3.00	4.50	1.00		1	8	
Lincoln.....							
Middlesex.....	1.16				1	7	3
Norfolk.....						1	1
Northumberland and Durham.....	6.75		8.00	101	3	68	
Ontario.....	10.30	0.18	1.85		1	56	12
Oxford.....	4.50					6	
Peel.....							
Perth.....			1.00	323		2	
Peterborough.....							1
Prescott and Russell.....	0.75		0.75				
Prince Edward.....	4.32	4.32				67	2
Renfrew.....	7.85	11.70			1	4	44
Simcoe.....	6.91		5.25		3	27	18
Stormont, Dundas and Glengarry.....	10.95	7.47 3.72		35	6	9	20
Victoria.....	4.10	2.50	1.90	32	2	67	1
Waterloo.....	9.50	2.00 3.72		36	1	21	3
Welland.....		Concrete			2	1	1
Wellington.....	2.22		2.00		3	4	2
Wentworth.....	5.50	2.50 3.00			1	58	1
York.....	13.18	Concrete 5.03 Asp. Con. 6.00	3.44	294	1	27	5
Totals.....	182.27	*79 08	82.41	3,617	54	708	171

*Includes:—

Waterbound Macadam.....	48.93 miles
Concrete.....	15.23 "
Bituminous Macadam.....	6.72 "
Asphaltic Concrete.....	8.20 "

No. 3

1923

on Provincial County Road Construction

Approved Expenditure for Year

Roads and Culverts	Bridges	Special Grants to Towns and Villages	Approved Expenditure on Construction	Approved Expenditure on Maintenance	Total Approved Expenditure	Government Grant 60%
\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
24,642 73	3,649 29		28,292 02	42,654 80	70,946 82	42,568 09
82,880 48	10,592 59	4,242 06	97,715 13	11,086 92	108,802 05	65,281 23
141,407 19			141,407 19	13,713 45	155,120 64	93,072 38
14,449 62	2,576 45	720 20	17,746 27	11,397 77	29,144 04	17,486 42
1,189 17		2,081 50	3,270 67	13,497 59	16,768 26	10,060 95
237,267 66	1,533 99		238,801 65	32,829 71	271,631 36	162,978 82
30,108 52			30,108 52	13,219 80	43,328 32	25,996 99
35,988 19		2,472 25	38,460 44	24,816 98	63,277 42	37,966 45
3,407 13	1,436 42		4,843 55	2,788 20	7,631 75	4,579 05
3,098 73			3,098 73	5,979 63	9,078 36	5,447 02
26,033 50	6,193 33		6,193 33	27,433 74	6,193 33	3,716 00
	3,626 16		29,659 66		57,093 40	34,256 04
6,982 66	2,861 45	11,988 17	21,832 28	21,636 15	43,468 43	26,081 06
48,171 21	16,219 66	3,134 23	67,525 10	16,005 01	83,530 11	50,118 07
9,754 87	8,700 33		18,455 20	16,495 71	34,950 91	20,970 55
41,916 60	1,310 46		43,227 06	6,528 84	49,755 90	29,853 54
2,842 40			2,842 40	11,189 58	14,031 98	8,419 19
22,862 43	840 68		23,703 11	8,487 84	32,190 95	19,314 57
3,068 58	3,358 93		6,427 51	12,103 60	18,531 11	11,118 67
284 16	1,489 33		1,773 49	11,041 54	12,815 03	7,689 02
25,447 75	2,902 69	8,921 17	37,271 61	10,739 28	48,010 89	28,806 53
23,746 78	1,657 48	1,651 00	27,055 26	12,824 22	39,879 48	23,927 69
3,132 70	80 00	18,000 00	21,212 70	4,870 61	26,083 31	15,649 99
3,096 95			3,096 95	7,243 57	10,340 52	6,204 31
607 12			607 12	4,565 16	5,172 28	3,103 37
8,858 02			8,858 02	5,957 92	14,815 94	8,889 56
24,104 45			24,104 45	5,052 14	29,156 59	17,493 95
134,430 41	2,393 27		136,823 68	16,589 78	153,413 46	92,048 08
56,206 57	4,794 28	405 27	61,406 12	28,501 71	89,907 83	53,944 70
115,997 61	6,168 50		122,166 11	44,931 17	167,097 28	100,258 37
58,611 24	5,084 97	10,367 99	74,064 20	12,566 35	86,630 55	51,978 33
93,731 85	5,159 22	2,047 74	100,938 81	9,810 76	110,749 57	66,449 74
22,836 57	11,618 90	14,266 20	41,301 66	20,419 70	61,721 36	37,032 82
17,644 38	35,965 97	8,640 38	62,250 73	39,638 14	101,888 87	61,133 32
80,096 85	1,810 00		81,906 85	13,704 93	95,611 78	57,367 07
123,162 29	1,220 00		124,382 29	6,709 47	131,091 76	78,655 06
1,528,067 37	143,244 35	67,251 95	1,738,563 67	547,031 77	2,285,595 44	1,371,357 28

†Deduct over payment in 1922.

APPENDIX SUMMARY,

Schedule of Expenditure on Maintenance

For the period beginning January 1st, 1923

County	Grading	Culverts	Re-surfacing	Dragging	Oiling or Tarring
	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
Brant.....	1,399 10	316 33	31,943 77	2,550 20	3,426 56
Bruce.....	729 89	279 94	5,832 64	1,892 56	.....
Carleton.....	487 71	98 48	4,209 01	48 45	6,899 99
Dufferin.....	1,490 35	122 80	7,461 29	1,134 61	165 45
Elgin.....	845 47	143 15	7,546 42	1,775 07	2,663 77
Essex.....	74 00	75 73	27,201 21	2,920 54	.....
Frontenac.....	2,177 37	1,008 45	9,471 80	.....	.....
Grey.....	6 25	88 95	4,475 20	261 11	19,284 66
Haldimand.....	2,526 20	7 50	.....	222 10	.....
Halton.....	387 58	18 40	5,047 42	194 35	.....
Hastings.....	9,124 35	840 82	11,049 17	890 68	3,491 16
Huron.....	1,538 81	1,717 63	11,500 27	1,557 21	1,042 44
Kent.....	1,690 75	465 77	8,921 36	3,489 50	572 40
Lambton.....	2,377 97	707 43	9,841 66	2,033 44	189 22
Lanark.....	532 50	163 50	2,951 30	.....	132 13
Leeds and Grenville.....	253 00	1,573 31	8,774 47	.....	.....
Lennox and Addington.....	462 85	164 87	6,698 10	18 00	.....
Lincoln.....	.....	.....	.....	.....	.....
Middlesex.....	39 40	27 00	7,854 48	2,396 30	577 65
Norfolk.....	758 94	267 07	9,608 51	300 52	.....
Northumberland and Durham	406 25	193 20	5,070 32	2,139 58	646 61
Ontario.....	827 83	129 49	8,067 78	1,177 76	1,336 94
Oxford.....	135 55	84 07	3,521 89	715 65	.....
Peel.....	.....	.....	.....	.....	.....
Perth.....	252 88	76 17	5,621 07	406 86	136 00
Peterborough.....	847 55	119 31	3,417 17	.....	.....
Prescott and Russell.....	.....	.....	.....	37 86	5,706 66
Prince Edward.....	47 25	94 25	1,420 83	62 00	3,194 46
Renfrew.....	473 75	633 69	156 40	96 00	14,589 72
Simcoe.....	1,790 18	195 19	23,862 48	576 22	262 28
Stormont, Dundas and Glen- garry.....	374 75	250 56	11,417 68	263 12	30,023 85
Victoria.....	1,026 41	304 14	7,485 76	1,210 00	323 81
Waterloo.....	97 40	.....	7,182 65	549 45	1,155 92
Welland.....	350 36	74 47	12,416 17	191 30	7,328 40
Wellington.....	7,345 84	3,368 53	21,217 06	4,422 23	1,074 59
Wentworth.....	3,933 25	1,035 22	7,810 34	926 12	.....
York.....	120 35	.....	3,340 75	437 90	1,301 40
Totals.....	44,932 09	14,645 42	302,396 43	34,896 69	105,526 07

No. 4

1923

and Repair on Provincial County Roads

and ending December 31st, 1923.

Snow Shovelling	Bridges	Ditching and Draining	Cutting Weeds and Brush	Wire Fence Bonus	Total Expenditure	Government Grant, 60%
\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
789 82	1,802 82		426 20		42,654 80	25,592 88
1,037 70	1,144 92		169 27		11,086 92	6,652 15
1,156 66		550 13	263 02		13,713 45	8,228 07
681 47	162 30	125 50	54 00		11,397 77	6,838 66
114 75	104 72		304 24		13,497 59	8,098 55
31 97	1,901 40	347 60	277 26		32,829 71	19,697 83
241 14	143 56		17 50	159 98	13,219 80	7,931 88
389 36	311 45				24,816 98	14,890 19
	5 40		27 00		2,788 20	1,672 92
191 20	140 68				5,979 63	3,587 78
418 85	1,333 71		285 00		27,433 74	16,460 24
1,642 93	2,020 31	318 93	297 62		21,636 15	12,981 69
23 25	46 67	359 56	435 75		16,005 01	9,603 01
		{Operating Ferry672 14 }	143 20		16,495 71	9,897 43
23 80	506 85			2,105 11	6,528 84	3,917 30
33 00	611 30				11,189 58	6,713 75
10 00		578 80		41 50	8,487 84	5,092 70
994 02	108 50					
590 57	186 86	217 26	214 08		12,103 60	7,262 16
12 00	8 50		86 00		11,041 54	6,624 92
997 92	250 42	738 38	296 60		10,739 28	6,443 56
721 14	87 95		316 78	158 55	12,824 22	7,694 53
245 53	{Guard Rail 26 68 }	50 64	90 60		4,870 61	2,922 37
586 92	163 67				7,243 57	4,346 14
161 10		12 00	8 03		4,565 16	2,739 10
213 40					5,957 92	3,574 75
233 35					5,052 14	3,031 28
28 20	373 82		238 20		16,589 78	9,953 87
560 37	1,015 59			239 40	28,501 71	17,101 03
1,182 18	1,125 60		293 43		44,931 17	26,958 70
476 50	65 58		638 65	1,035 50	12,566 35	7,539 81
613 84	211 50				9,810 76	5,886 46
7 40			51 60		20,419 70	12,251 82
1,835 89	140 51			233 49	39,638 14	23,782 88
					13,704 93	8,222 96
					6,709 47	4,025 68
1,406 48	102 59					
17,652 71	14,103 86	3,970 94	4,934 03	3,973 53	547,031 77	[328,219 05

APPENDIX

SUMMARY,

Statement of Work and Expenditure

County	Work Done During Year						
	Miles Graded	Miles Stoned	Miles Gravelled	Tile Drain Rods	Bridges	Pipe and Tile Culverts	Other Culverts
Brant.....	3.30		3.30	224			
Bruce.....	1.12		5.62		5	16	9
Carleton.....	26.00	3.30 Bit. Mac. 4.40 Asp. Con. 1.43	23.25	51	2	69	21
Dufferin.....	5.60		5.70		1	59	1
Elgin.....	7.92	1.57	5.09	784	2	17	3
Essex.....	19.70	Concrete 0.80	8.50	347	3	32	5
Frontenac.....	4.50	4.50 Concrete 0.79				10	1
Grey.....	12.58	3.14	7.37		6	6	1
Haldimand.....					1	17	2
Halton.....	5.00	3.00 Concrete 2.00			1	14	2
Hastings.....	12.97	2.47	10.50			17	8
Huron.....	3.12		5.12		2	1	2
Kent.....	1.62	0.87		904	2	22	3
Lambton.....	2.62	2.62		647	1	5	8
Lanark.....	10.72	9.97 Concrete 0.05	0.75		1	39	
Leeds and Grenville.....	3.75	5.25	0.75		4		
Lennox and Addington.....	1.50					19	1
Lincoln.....	2.29	0.15 Concrete 0.15				138	
Middlesex.....	16.25	2.14 Bit. Mac. 2.14				34	3
Norfolk.....	13.50		15.25	529		22	1
Northumberland and Durham.....	6.81		12.80		3	39	1
Ontario.....	2.35	0.50	2.05		1	19	7
Oxford.....	14.75	2.25	15.75	799	2	1	
Peel.....	15.43		15.82		4	69	10
Perth.....				981	2		6
Peterboro.....	3.75		2.75			17	
Prescott and Russell.....	44.73	19.24	20.74		5	40	
Prince Edward.....	4.02	4.02				21	2
Renfrew.....	23.71		25.49			43	44
Simcoe.....	4.75	1.00	4.75		4	30	2
Stormont, Dundas and Glengarry.....	25.37	16.40	2.14	157	1	36	10
Victoria.....	2.60	1.16 Concrete 0.54	1.16	9		58	8
Waterloo.....	2.10	1.00	0.56		3	7	2
Welland.....	4.00				1	2	6
Wellington.....	1.00		1.00	30	5	74	3
Wentworth.....	10.00	2.84 Bit. Mac. 8.41	2.25	101	2	75	2
York.....	40.42	6.00 Bit. Mac. 5.92 Asp. Con. 0.34 Brick 38.45	3.44	55	3	109	25
Totals.....	359.85	* 155.36	225.90	5,618	72	1,197	199

*Includes:—

126.96 miles Water-bound Macadam.
 5.33 miles Concrete.
 15.38 miles Bituminous Macadam.
 0.34 miles Brick.
 7.35 miles Asphaltic Concrete.

No. 5

1924

on County Road Construction

Approved Expenditure for Year									
Roads and Culverts	Bridges	Machinery and Repairs	Special Grants to Towns and Villages	Purchase of Gravel Pits and Stone Quarries	Superintendence	Approved Expenditure on Construction	Approved Expenditure on Maintenance	Total Approved Expenditure	Government Grant 40%
\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
12,202 69	15,353 27	15,174 62	9,200 49	2,114 10	4,394 79	33,886 20	16,079 22	49,965 42	19,986 17
243,502 41	2,660 82	8,897 11			4,686 44	52,753 75	16,799 79	69,553 54	27,821 42
14,074 43	1,131 64	1,530 67	63 50	200 00	2,613 23	19,820 90	21,273 99	41,094 89	16,437 96
31,278 77	6,839 17	9,448 84	8,466 69		3,061 41	59,094 88	67,511 08	126,605 96	50,642 38
71,760 77	3,434 66	1,640 72	6,000 00	1,560 63	4,157 13	88,553 91	97,014 90	185,568 81	74,227 52
9,599 69		1,212 62			1,908 83	12,721 14	27,187 43	39,908 57	15,963 42
82,781 62	9,959 26	1,992 76	3,775 23		4,063 94	102,572 81	37,420 15	139,992 96	55,997 18
2,138 70	1,249 63	1,472 05	4,012 89		2,775 50	11,648 77	33,774 95	45,423 72	18,169 49
54,150 21	1,567 36	564 65			2,038 75	58,320 97	21,657 22	79,978 19	31,991 28
28,409 39	6,861 77	4,140 08	from 1922-21		4,914 90	6,861 77	6,612 44	13,474 21	5,389 68
11,369 13	1,271 72	2,163 83	33,269 60	815 00	4,652 56	37,464 37	52,848 22	90,312 59	36,125 04
8,513 97	56,712 70	14,499 38	512 86	2,450 00	4,091 80	53,541 84	42,498 26	96,040 10	38,416 04
14,675 12	7,772 78	6,070 11	12,342 31	5,015 11	3,779 01	86,780 71	71,016 06	157,796 77	63,118 71
51,583 88	7,614 97	6,873 86			2,510 53	49,654 44	65,565 31	115,219 75	46,087 90
24,652 27	6,795 98	1,997 81	9,826 35		2,870 11	68,583 24	20,802 19	89,385 43	35,754 17
3,444 18		6,599 53	7,712 89		2,236 08	46,142 52	61,367 68	107,510 20	43,004 08
68,784 99		1,983 91	3,860 10		4,816 00	2,236 08	19,992 68	41,905 06	16,762 02
25,162 54	8,088 43	6,020 78			4,560 11	79,445 00	71,296 97	150,741 97	60,296 79
72,519 89	6,886 62	5,153 90	25,700 00	6,564 00	4,560 11	43,831 86	67,756 00	111,587 86	44,635 14
			5,114 27	Hold-backs from 1922 & 1923	3,183 78	120,008 19	40,220 33	160,228 52	64,091 41
21,338 53	12,858 15	2,246 83	8,245 73		4,129 54	5,114 27		5,114 27	2,045 71
11,189 88	1,308 28	513 84	19,853 14		4,430 66	48,818 78	15,574 84	64,393 62	25,757 44
Hold-back from 1922	1,951 00		1,936 05	Hold-back from '23	2,801 74	37,295 80	30,385 75	67,681 55	27,072 62
28,194 43	3,308 75	4,401 96	877 52			43,471 45	36,572 62	80,044 07	32,017 63
4,468 26	Hold-back from 1923				2,773 68	111,473 39	36,002 35	147,475 74	58,990 29
71,049 05	26,538 81	1,789 63	4,853 96		1,476 00	8,271 64	38,497 60	46,769 24	18,707 70
1,801 20	4,994 44				2,119 80	26,501 29	26,315 94	52,817 23	21,126 89
16,776 88	5,977 24	1,627 37			3,234 97	266,978 91	11,720 02	278,698 93	111,480 57
246,235 38	14,490 27	3,018 29			2,196 46	24,387 13	10,662 30	35,049 43	14,019 77
14,732 55	Hold-back from 1922	7,458 12	12,900 00			12,900 00		12,900 00	5,160 00
118,429 83	2,980 19	2,661 51	9,200 00		5,318 76	138,590 29	18,221 23	156,811 52	62,724 61
20,171 42	12,132 74	496 13	24,313 28		4,373 80	61,487 37	52,006 80	113,494 17	45,397 67
99,803 09	3,847 03	160 86	20,000 00		4,538 44	128,349 42	128,385 07	256,734 49	102,693 79
23,106 25	435 37	2,434 28	4,546 47		4,944 35	35,466 72	28,422 69	63,889 41	25,555 76
16,022 55	3,096 81	1,840 75	20,235 43		3,932 90	45,128 44	25,574 69	70,703 13	28,281 25
11,015 86	6,756 22	7,191 49	22,307 25		4,257 17	51,527 99	77,755 71	129,283 70	51,713 48
10,381 84	14,313 48	4,244 01			3,160 86	32,100 19	75,273 84	107,374 03	42,949 61
113,961 20	7,581 96	6,442 17	2,330 10	2,000 00	5,881 48	138,196 91	45,532 20	183,729 11	73,491 64
320,354 13	14,989 86	2,255 45	4,450 84	1,100 00	10,305 80	353,456 08	53,325 21	406,781 29	162,712 52
1,994,990 25	287,150 03	148,991 55	286,177 88	21,818 84	147,679 92	2,886,808 47	1,625,943 79	4,512,752 26	1,805,101 87

APPENDIX

SUMMARY,

Schedule of Expenditure on Maintenance

For the period beginning January 1st, 1924

County	Brushing and Weed Cutting	Draining and Ditching	Grading	Dragging	Culverts (Repairs)
	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
Brant.....	526 50	219 45	284 64	1,913 45	37 80
Bruce.....	262 10		1,102 66	1,915 56	291 14
Carleton.....	3,595 86	484 13	1,143 50	643 30	454 55
Dufferin.....	102 42	85 60	3,858 20	1,462 69	251 99
Elgin.....	1,323 69	524 35	5,946 04	5,683 84	790 91
Essex.....	692 67	1,221 82		11,161 29	240 70
Frontenac.....		34 00	2,596 05		147 58
Grey.....	38 80	17 40	1,788 93	4,409 04	826 18
Haldimand.....	1,034 90		809 65	4,102 80	387 07
Halton.....		92 10	373 20	800 05	161 89
Hastings.....	244 65		6,977 29	1,529 00	1,667 78
Huron.....	976 15	1,808 79	4,266 91	4,126 06	1,030 00
Kent.....	770 40	635 23	4,885 15	10,909 90	228 55
Lambton.....	179 10	1,745 51	3,588 79	13,387 12	1,548 09
Lanark.....	158 00		2,168 81		454 61
Leeds and Grenville.....	31 75	606 45	2,877 16	359 65	577 32
Lennox and Addington.....	43 50	2 50	3 00	101 50	712 01
Lincoln.....	1,768 52	3,955 57	7,173 88	3,179 41	1,200 18
Middlesex.....	1,606 98	1,391 34	1,629 29	12,549 53	421 89
Norfolk.....	808 68	11 12	3,400 12	3,482 88	454 99
Northumberland and Durham.....	366 82	294 45		4,576 35	367 97
Ontario.....	497 72		1,666 35	3,290 68	349 16
Oxford.....	696 05	951 89	2,279 35	1,719 42	839 69
Peel.....	245 29	765 48	5,815 12	1,918 76	940 98
Perth.....	170 65	390 43	4,136 27	521 53	218 06
Peterborough.....	102 15	730 04	540 15	2,645 27	943 47
Prescott and Russell.....	1,140 87	781 68	4,240 45	1,235 88	237 00
Prince Edward.....	6 25			79 25	92 50
Renfrew.....	468 70	99 00	1,985 49	1,266 28	1,038 37
Simcoe.....			2,605 73	1,873 01	220 33
Stormont, Dundas and Glen- garry.....	575 00		3,166 43	1,068 79	1,024 97
Victoria.....	1,053 07	1,114 15	3,986 09	2,023 57	147 19
Waterloo.....	49 61	201 05	503 96	1,237 78	95 45
Welland.....	243 30	99 00	1,041 90	414 75	162 23
Wellington.....	1,010 33	589 01	13,238 46	9,270 16	382 49
Wentworth.....	1,002 26	2,518 80	1,526 78	3,890 45	1,142 71
York.....	1,167 40	1,211 69	1,029 08	477 63	807 23
Totals.....	22,960 14	22,582 03	102,634 88	119,226 63	20,895 03

No. 6

1924

and Repair on County Roads

and ending December 31st, 1924

Bridges (Repairs)	Re-surfacing	Oiling	Snow Roads	Wire Fence Bonus	Total Expenditure	Government Grant, 40%
\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
.....	11,629 84	368 16	1,099 38	.....	16,079 22	6,431 69
2,213 76	8,557 02	.....	2,457 55	.....	16,799 79	6,719 92
345 00	28,815 37	12,599 58	7,019 07	.....	55,100 36	22,040 13
238 09	14,230 62	3 25	1,041 13	.....	21,273 99	8,509 59
2,240 68	48,395 26	61 45	2,544 86	.....	67,511 08	27,004 43
378 18	82,268 75	761 35	290 14	.....	97,014 90	38,805 96
18 40	15,280 52	8,075 03	684 01	351 84	27,187 43	10,874 97
597 32	23,936 49	1,507 77	3,573 17	725 05	37,420 15	14,968 06
110 43	25,729 15	.....	1,600 95	.....	33,774 95	13,509 98
43 54	18,870 85	.....	992 76	{Guard Rail 322 83}	21,657 22	8,662 89
.....	6,612 44	.....	.....	Hold back	6,612 44	2,644 98
2,738 01	35,022 05	2,455 73	2,066 91	146 80	52,848 22	21,139 29
2,172 81	22,417 16	1,725 21	3,975 17	.....	42,498 26	16,999 30
1,371 02	49,842 90	674 51	456 00	{Ferry 1,242 40}	71,016 06	28,406 42
2 456 28	41 899 05	{Calc. Chlor. 603 50}	157 87	.....	65,565 31	26,226 12
1 054 08	13 860 79	2 385 45	720 45	.....	20,802 19	8,320 88
1 315 23	55 254 28	48 14	152 04	145 66	61,367 68	24,547 07
.....	19 705 82	.....	1,269 05	75 00	21,912 38	8,764 95
197 92	35 513 95	15,676 40	2,631 14	.....	71,296 97	28,518 79
995 18	41,786 38	3,247 06	4,128 35	.....	67,756 00	27,102 40
874 96	27,963 48	.....	3,095 90	{Guard Rails 128 20}	40,220 33	16,088 13
269 41	6,101 36	.....	3,598 48	.....	15,574 84	6,229 94
149 12	20,291 18	{Calc. Chlor. 472 53}	2,584 36	1,084 65	30,385 75	12,154 30
609 88	23,624 63	2,780 12	2,725 45	346 14	36,572 62	14,629 05
237 24	24,182 03	1,865 67	20 00	{Guard Rails 11 78}	36,002 35	14,400 94
491 47	27,744 66	2,778 67	2,045 86	.....	38,497 60	15,399 04
3,815 65	14,741 91	.....	2,394 49	402 81	26,315 94	10,526 37
52 65	2,404 07	.....	1,627 42	.....	11,720 02	4,688 00
24 00	2,354 00	6,523 60	1,582 70	.....	10,662 30	4,264 92
225 37	7,854 62	4,901 49	323 25	{Guard Rails 58 66}	18,221 23	7,288 49
266 80	43,032 43	.....	3,225 83	782 67	52,006 80	20,802 72
1,527 69	101,122 59	17,062 34	2,837 26	.....	128,385 07	51,354 03
149 69	15,922 06	1,474 34	1,366 15	1,186 38	28,422 69	11,369 07
364 64	20,260 07	.....	2,862 13	.....	25,574 69	10,229 88
476 24	63,011 86	11,068 07	1,238 36	.....	77,755 71	31,102 28
656 22	43,616 16	1,439 00	5,072 01	.....	75,273 84	30,109 54
56 85	20,458 79	3,928 44	11,007 12	.....	45,532 20	18,212 88
.....	35,564 07	6,883 25	6,184 86	.....	53,325 21	21,330 09
28,733 81	1,099,878 66	111,370 11	90,651 63	7,010 87	1,625,943 79	650,377 49

APPENDIX

SUMMARY,

Statement of Work and Expenditure

County	Work Done During Year						
	Miles Graded	Miles Stoned	Miles Gravelled	Tile Drain Rods	Bridges	Pipe and Tile Culverts	Other Culverts
Brant.....	4 88		4 88	325		78	
Bruce.....	2 12		30 50		3	29	5
Carleton.....	10 00	Bit. Mac. 2 50	3 50		1	13	1
Dufferin.....	3 10		6 40		1	31	2
Elgin.....	0 50			305		6	
Essex.....	7 00	Concrete 3 50	0 50	502	3	11	
Frontenac.....	5 25	5 25				5	1
Grey.....	5 00		4 50				11
Haldimand.....							
Halton.....	3 75	Concrete 3 75	2 25			1	5
Hastings.....	5 50	3 75	1 75			14	1
Huron.....	4 25		4 25		6	3	12
Kent.....	4 90	Concrete 4 90		133	1	12	
Lambton.....	3 50	Concrete 0 01	5 50	250	3	4	2
		Bit. Mac. 5 00					
Lanark.....	6 50	1 50				29	
		Bit. Mac. 1 00					
Leeds and Grenville.....	3 20	1 50	0 50				14
Lennox and Addington.....	8 10	5 35	2 00		1	18	6
Lincoln.....							
Middlesex.....	0 75	Concrete 2 00		178		12	1
Norfolk.....	6 50		6 50	61		18	
Northumberland and Durham.....	4 28		11 70		1	13	2
Ontario.....	1 29	1 30	0 65			5	1
Oxford.....	2 50	4 25	2 50	10	6	2	
Peel.....							
Perth.....				79	1	2	
Peterboro.....	0 25		0 25				
Prescott and Russell.....	3 00		2 50				
Prince Edward.....	2 25	2 25			1	38	1
Renfrew.....	4 20	5 30			1	2	11
Simcoe.....	13 75		11 50		1	24	2
Stormont, Dundas and Glengarry.....		2 72					
	19 45	11 97	5 00	35		31	7
Victoria.....	3 36	4 80	2 00			46	6
Waterloo.....	5 75	Concrete 5 00		75	2	22	3
Welland.....						10	
Wellington.....					1	46	1
		Bit. Mac. 0 64					
Wentworth.....	2 72	1 81		4		43	
		Asp. Con. 3 37					
York.....	16 10	11 27	8 07	15		14	3
Totals.....	163.70	*92.19	118.95	1,972	32	584	98

*Includes:—

57.80 miles Water-bound Macadam.

19.16 miles Concrete.

11.86 miles Bituminous Macadam.

3.37 miles Asphaltic Concrete.

No. 7

1924

on Provincial County Road Construction

Approved Expenditure for Year

Roads and Culverts	Bridges	Special Grants to Towns and Villages	Approved Expenditure on Construction	Approved Expenditure on Maintenance	Total Approved Expenditure	Government Grant 60%
\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
39,792 12			39,792 12	37,480 72	77,272 84	46,363 70
35,157 64	1,929 63	16,734 14	53,821 41	13,577 45	67,398 86	40,439 32
86,836 20	25,317 20		112,153 40	27,059 54	139,212 94	83,527 76
		101 49	101 49		101 49	60 90
16,918 77	1,098 14	1,162 59	19,179 50	12,151 33	31,330 83	18,798 50
1,575 04	3,258 52	1,052 00	5,885 56	16,374 05	22,259 61	13,355 77
116,229 87	11,297 61		127,527 48	44,510 55	172,038 03	103,222 82
11,141 60			11,141 60	12,425 10	23,566 70	14,140 02
17,414 18		1,350 00	18,764 18	21,496 65	40,260 83	24,156 50
				750 20	750 20	450 12
96,578 57			96,578 57	5,000 46	101,579 03	60,947 42
15,913 19			15,913 19	32,710 15	48,623 34	29,174 00
20,981 55	10,230 71	21,174 43	52,386 69	27,716 72	80,103 41	48,062 05
95,487 25	2,842 00	7,602 00	105,931 25	23,153 87	129,085 12	77,451 07
5,397 65	26,314 25	614 92	32,326 82	20,064 97	52,391 79	31,435 07
85,801 77			85,801 77	10,014 93	95,816 70	57,490 02
27,518 74			27,518 74	19,915 17	47,433 91	28,460 35
30,672 88	5,254 04		35,926 92	18,789 02	54,715 94	32,829 56
48,839 54		1,529 76	50,369 30	14,871 20	65,240 50	39,144 30
25,930 03			25,930 03	3,718 02	29,648 05	17,788 83
		3,960 00	3,960 00		3,960 00	2,376 00
16,902 92	3,545 63	2,105 00	22,553 55	10,257 61	32,811 16	19,686 70
8,397 81		36,574 35	44,972 16	11,216 91	56,183 07	33,709 84
11,907 92	13,097 91	2,791 82	27,797 65	5,633 59	33,431 24	20,058 74
3,245 08	2,475 95		5,721 03	10,981 63	16,702 66	10,021 60
584 30			584 30	4,462 87	5,047 17	3,028 30
20,980 93			20,980 93	292 15	21,273 08	12,763 85
13,980 99		2,500 00	16,480 99	9,030 58	25,511 57	15,306 94
104,996 18	4,228 64		109,224 82	20,053 93	129,278 75	77,567 25
45,173 42	7,468 60	3,051 01	55,693 03	21,601 81	77,294 84	46,376 90
95,693 32	1,883 56		97,576 88	57,734 85	155,311 73	93,187 04
27,473 28	9 70	17,768 45	45,251 43	18,962 07	64,213 50	38,528 11
128,764 57	10,832 89	19,031 15	158,628 61	4,510 26	163,138 87	97,883 32
846 38	13,074 78	1,102 16	15,023 32	40,680 39	55,703 71	33,422 23
16,306 19	805 05	4,680 35	21,791 59	63,746 66	85,538 25	51,322 95
28,297 24			28,297 24	8,032 81	36,330 05	21,798 03
96,303 20			96,303 20	11,836 39	108,139 59	64,883 75
1,398,040 32	144,964 81	144,885 62	1,687,890 75	660,808 61	2,348,699 36	1,409,219 63

APPENDIX

SUMMARY,

Schedule of Expenditure on Maintenance

For the period beginning January 1st, 1924

County	Brushing and Weed Cutting	Ditching and Draining	Grading	Dragging	Culverts (Repairs)
	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
Brant.....	369 10	70 36	1,895 88	3,289 80	186 30
Bruce.....	188 90		1,181 79	2,633 73	134 37
Carleton.....	1,434 58	1,943 69	175 28	547 20	106 22
Dufferin.....	280 25	35 65	1,545 10	1,423 10	148 10
Elgin.....	276 69	124 59	2,154 59	1,276 42	155 07
Essex.....	495 37	372 95	6,549 84	2,869 24	401 10
Frontenac.....	14 25		2,189 82		171 97
Grey.....	21 05	11 25	694 21	1,105 22	1 50
Haldimand.....	95 60		218 50	324 50	
Halton.....				653 90	34 30
Hastings.....	250 92		8,487 50	721 92	961 35
Huron.....	650 86	412 58	1,228 32	2,662 72	772 24
Kent.....	437 85	324 49	3,763 12	3,679 23	131 20
Lambton.....	33 85	659 87	1,149 45	4,799 86	431 82
Lanark.....			395 15		
Leeds and Grenville.....				253 80	141 44
Lennox and Addington.....	9 00				68 24
Lincoln.....					
Middlesex.....	257 95	218 69	822 18	3,192 23	121 55
Norfolk.....	91 92	16 50	397 73	288 84	291 80
Northumberland and Durham.....	225 60	261 00		2,358 64	132 95
Ontario.....	206 50		277 30	1,963 42	124 75
Oxford.....	121 30	358 13	196 73	700 25	43 52
Peel.....					
Perth.....	8 80	99 95	679 85	544 38	94 15
Peterborough.....	15 75	39 00	196 75	834 75	25 85
Prescott and Russell.....					
Prince Edward.....				37 50	134 30
Renfrew.....	215 55		141 35	40 00	479 51
Simcoe.....			1,467 57	782 82	94 50
Stormont, Dundas and Glen- garry.....	270 50		1,214 95	192 68	244 86
Victoria.....	1,179 24	892 90	1,229 44	1,998 12	110 63
Waterloo.....	37 00	184 75	316 95	399 71	22 50
Welland.....	268 65	500 00	1,020 33	208 62	249 06
Wellington.....	146 85	515 42	13,460 57	5,379 66	162 14
Wentworth.....	136 60	1,028 70	448 35	322 60	84 25
York.....	352 29	125 42	398 24	176 39	151 25
Totals.....	8,092 77	8,195 89	53,896 84	45,661 25	6,412 79

No. 8

1924

and Repair on Provincial County Roads

and ending December 31st, 1924.

Bridges (Repairs)	Re-surfacing	Oiling	Snow Roads	Wire Fence Bonus	Total Expenditure	Government Grant 60%
\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
102 64	28,937 33	1,264 49	1,364 82		37,480 72	22,488 43
1,387 30	5,619 55		2,431 81		13,577 45	8,146 47
88 98	11,046 42	9,852 40	1,864 77		27,059 54	16,235 72
5 83	7,827 78	25 25	860 27		12,151 33	7,290 80
15 00	7,705 04	4,251 30	415 35		16,374 05	9,824 43
1,060 14	32,113 81	519 25	128 85		44,510 55	26,706 33
573 48	7,621 94	1,219 55	370 25	263 84	12,425 10	7,455 06
	7,876 06	11,165 96	494 72	126 68	21,496 65	12,897 99
			111 60		750 20	450 12
	3,049 73		1,262 53		5,000 46	3,000 28
269 72	16,880 62	4,371 79	471 83	294 50	32,710 15	19,626 09
2,883 80	15,819 78	752 93	2,533 49		27,716 72	16,630 03
904 94	13,114 49	489 40	309 15		23,153 87	13,892 32
				{ Ferry }		
207 44	11,602 08	223 43	423 65	{ 533 52 }	20,064 97	12,038 99
339 30	2,519 38	2,694 71	64 00	4,002 39	10,014 93	6,008 95
	19,439 93		80 00		19,915 17	11,949 10
178 25	9,772 93	7,784 50	976 10		18,789 02	11,273 41
161 45	8,266 55	736 29	1,094 31		14,871 20	8,922 72
				{ Guard Rails }		
15 00	1,128 99	970 72	497 19	{ 19 33 }	3,718 02	2,230 81
59 58	4,523 46	789 31	1,907 07		10,257 61	6,154 57
44 05	6,381 98	{ Calc. Chlor. }	1,108 57	391 15	11,210 91	6,726 55
	3,178 22	713 19	815 44		5,633 59	3,380 15
		220 00				
73 20	8,842 73	45 81	592 76		10,981 63	6,588 98
	3,128 92		221 85		4,462 87	2,677 72
			292 15		292 15	175 29
	1,661 85	6,450 53	446 40	300 00	9,030 58	5,418 35
				{ Guard Rails }		
2 50	309 75	18,698 59	29 75	{ 136 93 }	20,053 93	12,032 36
215 66	17,841 09		893 02	307 15	21,601 81	12,961 08
1,725 41	30,505 50	21,460 28	2,120 67		57,734 85	34,640 91
180 16	5,430 73	5,983 05	1,218 60	739 20	18,962 07	11,377 24
	2,418 46	125 00	1,005 89		4,510 26	2,706 16
19 56	25,297 32	12,802 20	314 65		40,680 39	24,408 23
1,482 66	38,770 58	858 51	2,970 27		63,746 66	38,248 00
	3,463 56	582 50	1,966 25		8,032 81	4,819 69
	7,482 15	1,014 21	2,136 44		11,836 39	7,101 83
11,996 05	369,578 71	116,065 15	33,794 47	7,114 69	660,808 61	394,485 16

APPENDIX

SUMMARY,

Statement of Work and

(Prior to Revision)

County	Work Done						
	Miles Graded	Miles Stoned	Miles Gravelled	Tile Drain Rods	Bridges	Pipe and Tile Culverts	Other Culverts
Brant.....	0.15		0.15			5	
Bruce.....	4.12				5	6	
Carleton.....	5.90	Asp. Con. 0.90					
Dufferin.....	2.74		7.00	12	2	5	
Elgin.....	0.75		2.74	18	2	35	
Essex.....			0.75	58		7	
Frontenac.....	2.00	2.00					1
Grey.....					3		
Haldimand.....	4.37	14.25	13.25			15	
Halton.....							
Hastings.....	2.50		3.00		1	5	1
Huron.....	4.75		4.50		1	3	
Kent.....	3.35		2.20			6	
Lambton.....	2.25		3.12			12	3
Lanark.....	1.00	1.00				2	
Leeds and Grenville.....	2.40	1.90	0.50	5	1	3	
Lennox and Addington.....		0.50	1.00			2	
Lincoln.....					1	2	
Middlesex.....	5.62		1.37			9	
Norfolk.....	2.42		2.17	27	2	6	
Northumberland and Durham.....	0.25		2.50			3	
Ontario.....						5	
Oxford.....	3.00		5.50		1	1	
Peel.....	2.20		3.00			7	
Perth.....				39		1	
Peterboro.....	.33		.33		1	1	
Prescott and Russell.....	15.58	13.08	4.00		1	14	3
Prince Edward.....					1		
Renfrew.....	6.80		7.30		2	13	17
Simcoe.....					3	5	
Stormont, Dundas and Glengarry.....	8.50		5.00		1	15	
Victoria.....	0.96		0.96			36	
Waterloo.....						3	
Welland.....							
Wellington.....	0.15	Concrete 0.15			4	39	5
Wentworth.....	2.25	2.50					1
York.....	0.63					14	
Totals.....	84.97	*36.53	70.34	159	31	280	31

*Includes:—

35.48 miles Water-bound Macadam.

0.15 miles Concrete.

0.90 miles Asphaltic Concrete.

No. 9

1925

Expenditure on County Roads

of System)

Approved Expenditure							
Roads and Culverts	Bridges	Urban Improvement	Total Construction	Maintenance	Total Approved Expenditure	Subsidy 40%	
\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
1,964 72		Gravel Pits					
1,143 51	8,686 76	550 00	2,514 72	2,134 51	4,649 23	1,859 69	
			9,830 27	5,978 30	15,808 57	6,323 43	
63,133 91	7,605 01		70,738 92	9,747 66	80,486 58	32,194 63	
10,066 06	1,641 91		11,707 97	7,925 03	19,633 00	7,853 20	
1,776 83	407 13		2,183 96	8,637 64	10,821 60	4,328 64	
736 42			736 42	32,239 77	32,976 19	13,190 48	
4,545 35			4,545 35	5,668 74	10,214 09	4,085 64	
374 05	4,875 40		5,249 45	hold backs	5,249 45	2,293 57	
	14,128 03		14,128 03	13,205 70	27,333 73	10,933 49	
57,026 13	3,429 75		60,455 88	3,262 40	63,718 28	25,487 31	
				775 04	775 04	310 02	
2,754 96	788 40		3,543 36	16,227 97	19,771 33	7,908 53	
10,804 93	4,481 49		15,286 42	10,593 97	25,880 39	10,352 16	
3,461 95		850 00	4,311 95	13,002 73	17,314 68	6,925 87	
5,644 59			5,644 59	9,472 17	15,116 76	6,046 70	
4,132 69			4,132 69	3,070 46	7,203 15	2,881 26	
14,392 78	6,517 18	2,322 60	23,232 56	22,022 39	45,254 95	18,101 98	
4,657 12			4,657 12	2,472 91	7,130 03	2,852 01	
		3,265 50	3,265 50		3,265 50	1,306 20	
		Hold-back from 1924			Hold-back from m 1924		
728 80	6,316 32		7,045 12	4,804 37	11,849 49	4,739 80	
6,766 72			6,766 72	9,125 47	15,892 19	6,356 88	
6,900 40	4,251 49		11,151 89	5,191 56	16,343 45	6,537 38	
		200 00	200 00		200 00	80 00	
		Hold-backs from m 1922 & 1923			Hold-backs from m 1922 & 1923		
2,745 16			2,745 16	4,267 43	7,012 59	2,805 04	
507 73			507 73	2,778 06	3,285 79	1,314 32	
6,954 70	620 00		7,574 70	1,381 84	8,956 54	3,582 62	
4,977 18			4,977 18	2,616 15	7,593 33	3,037 33	
131 33			131 33	5,960 54	6,091 87	2,436 75	
1,159 35			1,159 35	3,654 71	4,814 06	1,925 62	
92,140 88	3,416 60		95,557 48	5,125 93	100,683 41	40,273 36	
	1,520 67		1,520 67	260 30	1,780 97	712 39	
24,276 67	4,733 44		29,010 11	4,019 77	33,029 88	13,211 95	
440 70	9,617 44		10,058 14	21,767 91	31,826 05	12,730 42	
31,244 07	1,168 60		32,412 67	35,685 24	68,097 91	27,239 16	
7,633 87			7,633 87	6,038 09	13,671 96	5,468 78	
1,832 56			1,832 56	3,657 72	5,490 28	2,196 11	
				467 34	467 34	186 94	
		4,986 25	4,986 25		4,986 25	2,091 75	
9,405 33	8,114 06		17,519 39	31,557 69	49,077 08	19,630 83	
5,563 02			5,563 02	4,778 65	10,341 67	4,136 67	
731 04			731 04	2,923 83	3,654 87	1,461 95	
390,755 51	92,319 68	12,174 35	495,249 54	322,499 99	817,749 53	328,290 86	

APPENDIX

SUMMARY,

Schedule of Expenditure on Maintenance

For the period beginning January 1st, 1925

(Prior to Revision)

County	Brushing and Weed Cutting	Ditching and Draining	Grading	Dragging	Culverts (Repairs)
	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
Brant	21 00	32 00		338 70	
Bruce	131 80		168 45	418 22	92 10
Carleton			189 50	414 25	491 79
Dufferin	9 05		1,507 80	502 55	67 07
Elgin	283 46	32 73	1,503 10	936 11	163 12
Essex	338 75	480 20	423 53	3,874 14	136 90
Frontenac			671 50	32 30	49 05
Grey	3 00		598 84	1,480 44	370 50
Haldimand	255 30		89 50	717 55	38 00
Halton				90 80	54 60
Hastings	169 45		1,787 43	669 79	868 11
Huron	308 85	299 03	402 45	750 83	83 05
Kent	312 15	60 50	1,062 10	2,802 83	52 50
Lambton	23 95	120 25	1,117 05	2,415 30	155 17
Lanark					
Leeds and Grenville			1,051 30	608 23	42 54
Lennox and Addington				187 27	86 32
Lincoln	283 22	141 65	305 50	1,035 42	34 80
Middlesex	297 75	85 65	497 27	1,648 57	51 15
Norfolk	39 05		444 36	314 94	49 98
Northumberland and Durham	97 77	101 83		1,204 05	119 96
Ontario	45 75		222 75	422 35	40 50
Oxford	27 50	101 43	274 00	43 50	
Peel	32 70	4 55	5 38	274 65	2 75
Perth		43 35	469 97	50 20	118 61
Peterborough	9 05	383 00	292 60	396 80	206 70
Prescott and Russell	330 87	260 47	470 78	473 20	72 50
Prince Edward				15 00	
Renfrew	74 25	86 87	878 40	247 55	64 85
Simcoe			2,124 44	729 70	341 20
Stormont, Dundas and Glen- garry	423 75		1,113 21	218 75	289 56
Victoria	247 75	187 85	591 85	388 85	5 90
Waterloo	5 30			178 75	44 30
Welland	20 90		41 60	301 52	
Wellington	94 30	1,392 33	10,067 82	2,402 46	301 98
Wentworth	269 63	38 00	54 50	528 25	8 50
York	20 00	35 00	17 50	8 40	3 23
Totals	4,176 30	3,886 69	28,444 48	27,122 22	4,507 29

No. 10

1925

and Repair on County Roads

and ending December 31st, 1925.

of System)

Bridges (Repairs)	Re-surfacing	Oiling	Snow Roads	Wire Fence Bonus	Total Expenditure	Government Grant, 40%
\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
.....	1,492 30	238 21	12 30	.....	2,134 51	853 80
136 56	4,025 54	.....	1,005 63	.....	5,978 30	2,391 33
37 80	6,568 67	1,741 40	304 25	.....	9,747 66	3,899 07
62 06	5,478 33	.....	298 17	.....	7,925 03	3,170 01
118 06	5,491 91	.....	109 15	.....	8,637 64	3,455 06
473 49	25,873 35	612 61	26 80	.....	32,239 77	12,895 90
.....	4,685 24	.....	223 65	7 00	5,668 74	2,267 50
45 36	8,557 88	.....	1,761 18	388 50	13,205 70	5,282 28
84 08	1,783 67	.....	294 30	.....	3,262 40	1,304 96
.....	565 74	.....	63 90	.....	775 04	310 02
782 78	11,090 96	582 60	276 85	.....	16,227 97	6,491 19
184 88	7,981 22	.....	583 66	.....	10,593 97	4,237 59
635 41	8,069 74	.....	2 00	{ Guard Rails 5 50 }	13,002 73	5,201 09
.....	5,626 95	.....	13 50	.....	9,472 17	3,788 86
82 90	2,987 56	.....	.....	.....	3,070 46	1,228 18
105 30	19,973 27	.....	58 00	183 75	22,022 39	8,808 96
20 00	1,786 90	.....	318 30	74 12	2,472 91	989 16
523 63	2,360 30	.....	119 85	.....	4,804 37	1,921 75
1,075 73	5,286 04	27 61	155 70	.....	9,125 47	3,650 19
110 35	4,093 85	.....	104 85	34 20	5,191 56	2,076 63
92 60	2,311 57	.....	339 65	.....	4,267 43	1,706 98
129 31	1,371 97	.....	411 63	133 80	2,778 06	1,111 22
72 62	738 04	.....	114 25	10 50	1,381 84	552 74
212 84	2,053 83	.....	{ Guard Rail }	5 45 24 00 }	2,616 15	1,046 46
218 32	3,659 20	826 00	574 89	.....	5,960 54	2,384 22
.....	2,000 66	.....	206 75	159 15	3,654 71	1,461 88
.....	830 83	2,365 40	321 88	.....	5,125 93	2,050 37
.....	24 50	.....	220 80	.....	260 30	104 12
272 25	1,939 60	382 25	73 75	.....	4,019 77	1,607 90
183 45	16,768 24	.....	1,050 10	570 78	21,767 91	8,707 16
421 58	31,166 35	1,657 17	394 87	.....	35,685 24	14,274 09
122 76	3,604 36	493 45	190 17	205 15	6,038 09	2,415 23
.....	2,820 77	.....	608 60	.....	3,657 72	1,463 09
.....	.....	.....	103 32	.....	467 34	186 94
290 14	14,128 59	195 67	2,116 50	{ Guard Rails 567 90 }	31,557 69	12,623 08
.....	3,044 67	419 26	415 84	.....	4,778 65	1,911 46
.....	2,791 20	.....	48 50	.....	2,923 83	1,169 53
6,494 26	223,033 78	9,541 63	12,923 54	2,369 80	322,499 99	129,000 00

APPENDIX

SUMMARY,

Statement of Work and Expenditure

County	Work Done						
	Miles Graded	Miles Stoned	Miles Gravelled	Tile Drain Rods	Bridges	Pipe and Tile Culverts	Other Culverts
Brant.....	9.40		9.30		2	52	3
Bruce.....	17.37		38.12		9	46	5
Carleton.....	12.96	Bit. Mac. 3.46	12.25	122	2	75	16
	1.10		0.30	2 hold-backs			
Dufferin.....	6.23		7.95	37	1	48	1
Elgin.....	6.50	4.50	2.00	511	1	26	5
Essex.....	14.75	Concrete 9.00	2.25	588	2	6	4
Frontenac.....	6.25	4.50	1.75		1	12	2
Grey.....	20.53		19.53		1	4	40
Haldimand.....	4.00	39.25	1.50		2		3
Halton.....	1.00					3	
Hastings.....	25.30	Asp. Con. 3.30	13.75	40	11	101	8
Huron.....	14.50		13.50		11	2	6
		1.25					
Kent.....	22.56	Concrete 2.42	14.08	216	5	55	
Lambton.....	7.62	9.59	2.50	1,000	3	20	12
		2.75					
Lanark.....	9.25	Bit. Mac. 6.00	0.50		2	2	73
Leeds and Grenville.....	9.70	8.75	2.20	9	2	24	
Lennox and Addington.....	5.12	6.00				21	2
Lincoln.....					1	37	8
Middlesex.....	24.45	Concrete 3.20	3.75	551	2	40	14
Norfolk.....	15.47		18.22	82		32	2
Northumberland and Durham.....	12.78		18.28		5	70	2
Ontario.....	9.07	0.33	0.17		3	100	8
Oxford.....	21.25		30.00	180	2	20	
Peel.....	17.60		18.10		6	69	3
Perth.....	1.98		1.98	66	1	4	
Peterboro.....	4.82	0.66	2.66			37	8
Prescott and Russell.....	27.08	12.75	17.33			15	
Prince Edward.....	5.88	5.63				94	1
Renfrew.....	7.42		7.42			32	12
Simcoe.....	12.93		15.43		7	15	4
Stormont, Dundas and Glengarry.....	9.50	25.00	4.00		2	28	
		Bit. Mac. 2.00					
		Asp. Con. 0.54					
		1.15					
Victoria.....	5.18	Asp. Con. 0.47	4.03	31	3	110	
		0.34					
Waterloo.....	9.62	Concrete 3.53	1.00	131		17	3
		4.05					
Welland.....	4.20	Asp. Con. 0.15		14		15	4
Wellington.....	7.16	Concrete 2.16	5.00	36	6	63	3
		13.87					
Wentworth.....	17.12	Bit. Mac. 1.50	1.00	231	2	17	6
		Concrete 1.00					
		12.86					
York.....	45.18	Bit. Mac. 9.81	4.89	40	3	104	12
		Concrete 0.35					
		Asp. Con. 10.56					
Totals.....	452.83	*225.68	294.74	3,885	98	1,416	270

*Includes:—

166.23 miles Waterbound Macadam.
 21.66 " Concrete.
 22.77 " Bituminous Macadam.
 15.02 " Asphaltic Concrete.

No. 11

1925

on County Roads (Revised System)

Approved Expenditure									
Roads and Culverts	Bridges	Machinery and Repairs	Urban Improvement	Purchase of Gravel Pits	Superintendence	Total Construction	Maintenance	Total Approved Expenditure	Subsidy 50%
\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
38,359 67	1,416 29	19,287 20		314 20	4,279 07	63,656 43	40,197 22	103,853 65	51,926 83
62,147 57	22,820 34	10,431 00	19,943 68		4,281 78	119,624 37	30,752 94	150,377 31	75,188 66
168,815 35	10,482 59	4,894 05		3,017 50	10,564 24	197,773 73	57,049 63	254,823 36	127,411 67
{ 110,331 31 }						{ 1,033 31 }	2 hold-backs	1,033 31	538 01
21,025 64	1,360 03	1,621 58	3,386 34		2,790 68	30,184 27	17,111 20	47,295 47	23,647 74
19,555 02	2,664 71	13,259 02	8,330 27		3,468 66	47,277 68	67,088 61	114,366 29	57,183 15
275,200 76	4,898 65	8,497 25	10,735 25	1,517 80	4,323 38	305,173 09	108,350 71	413,523 80	206,761 90
15,299 42	911 05	1,936 27			1,999 22	20,145 96	33,825 35	53,971 31	26,985 65
82,840 16	595 88	2,744 87	5,109 19		4,271 26	95,561 36	24,686 64	120,248 00	60,124 01
111,975 34	2,720 80	1,693 11			3,050 36	119,439 61	17,785 26	137,224 87	68,612 44
			{ 9,748 86 }	Hold-back	from 1924	9,748 86		9,748 86	3,899 54
2,652 72		151 51			2,026 00	4,830 23	27,135 02	31,965 25	15,982 62
148,093 90	14,508 34	4,856 29			3,740 65	171,199 18	61,486 83	232,686 01	116,343 00
38,656 42	12,106 55	3,991 75	15,670 58	450 00	4,562 14	75,437 44	68,596 08	144,033 52	72,016 77
113,463 76	74,460 93	14,195 02	30,958 61		4,216 79	237,295 11	54,592 39	291,887 50	145,943 75
41,558 56	14,026 88	6,268 38	7,683 04	1,300 00	3,796 67	74,633 53	56,966 73	131,600 26	65,800 13
105,589 80	25,620 02	4,272 57			2,633 21	138,115 60	34,344 32	172,459 92	86,229 96
47,059 47	9,772 77	998 90	13,995 44		3,051 49	69,878 07	23,118 86	92,996 93	46,498 47
29,896 48		8,116 26	6,688 73		2,025 99	46,727 46	33,222 52	79,949 98	39,974 99
14,915 95	6,544 91	4,838 59	5,060 10		4,853 27	36,212 82	41,326 70	77,539 52	38,769 77
96,124 96	2,284 65	7,726 91	3,000 00		4,413 04	113,549 56	70,897 76	184,447 32	92,223 66
60,823 82		8,215 09	5,700 00		3,697 73	78,436 64	54,381 39	132,818 03	66,409 01
36,233 18	11,108 36	5,656 02	11,113 03		3,959 97	68,070 56	24,912 96	92,983 52	46,491 75
22,996 27	9,768 72	2,030 45			4,647 37	39,442 81	31,055 80	70,498 61	35,249 30
32,228 36	5,778 84	8,014 96			2,659 96	48,682 12	24,427 75	73,109 87	36,554 94
52,964 53	10,167 15	3,004 82			3,491 80	69,628 30	20,955 78	90,584 08	45,292 04
4,078 70	2,235 00	2,231 95				8,545 65	22,638 98	31,184 63	15,592 32
25,321 93		1,439 64			2,119 00	28,880 57	23,044 54	51,925 11	25,962 56
14,306 93		768 17	3,300 00		2,994 43	150,125 53	16,833 93	166,959 46	83,479 72
29,378 63		6,217 84			2,193 95	37,790 42	22,833 87	60,624 29	30,312 15
42,920 76		3,367 07	19,035 00		5,735 18	71,058 01	27,369 55	98,427 56	49,213 77
35,935 20	16,513 02	1,852 40	23,250 82		4,333 24	81,884 68	62,042 12	143,926 80	71,963 40
133,285 98	2,928 25	632 00	5,535 37		4,620 59	147,002 19	151,669 73	298,671 92	149,335 96
62,308 59	6,748 50	9,864 08	28,921 67		4,858 98	112,701 82	35,841 54	148,543 36	74,271 68
124,326 12		6,683 48	17,219 95		4,119 33	152,348 88	23,527 83	175,876 71	87,938 36
50,055 69		4,526 48	7,522 60		3,933 40	66,038 17	135,452 07	201,490 24	100,745 12
63,267 63	7,752 39	3,695 00	88,436 62	Supplemen	tary paymt	88,436 62	91,838 98	169,768 56	84,884 28
148,399 44	4,670 84	9,440 15	1,431 42		6,455 17	170,397 02	28,227 39	198,624 41	99,312 20
552,186 68	16,434 26	11,618 89	11,621 04		8,185 74	589,589 61	60,605 68	650,195 29	325,097 65
3,054,038 70	296,300 72	198,582 02	363,397 61	6,599 50	145,568 30	4,064,486 85	1,726,194 66	5,790,681 51	2,894,387 24

APPENDIX
SUMMARY,

Schedule of Expenditure on Maintenance

For the period beginning January 1st, 1925

County	Brushing and Weed Cutting	Ditching and Draining	Grading	Dragging	Culverts (Repairs)
	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
Brant.....	849 45	1,247 55	.....	6,335 00	28 80
Bruce.....	559 10	.....	2,423 11	4,296 80	246 42
Carleton.....	1,464 89	4,303 96	1,835 49	776 81	747 00
Dufferin.....	31 20	8 21	1,619 76	2,140 76	150 92
Elgin.....	1,292 39	469 98	6,687 06	5,987 06	890 99
Essex.....	1,256 91	3,359 35	2,549 51	10,965 22	741 75
Frontenac.....	270 93	.....	1,357 40	4,175 15	561 53
Grey.....	156 29	46 00	1,848 11	4,202 81	795 47
Haldimand.....	446 20	.....	633 35	1,589 15	240 89
Halton.....	.....	.....	829 53	1,497 74	600 52
Hastings.....	985 75	.....	7,243 55	3,540 24	1,564 47
Huron.....	1,326 23	1,641 67	3,320 45	7,682 41	1,606 71
Kent.....	1,710 88	1,455 00	2,312 70	12,814 66	539 94
Lambton.....	568 05	1,712 31	3,670 00	15,098 19	2,759 37
Lanark.....	1,575 44	.....	3,512 88	.....	1,879 42
Leeds and Grenville.....	10 00	294 40	1,420 04	194 20	32 05
Lennox and Addington.....	32 70	13 00	.....	476 65	299 65
Lincoln.....	1,997 13	1,001 38	.....	2,204 91	1,263 97
Middlesex.....	1,934 58	1,453 75	2,420 89	13,959 10	651 07
Norfolk.....	783 99	.....	3,496 38	3,063 65	801 66
Northumberland and Durham	287 88	852 84	.....	6,456 57	445 95
Ontario.....	742 66	310 10	1,621 25	4,116 69	261 00
Oxford.....	632 55	1,612 24	1,234 71	1,906 84	1,842 31
Peel.....	315 68	178 50	1,107 99	1,673 52	1,076 41
Perth.....	113 90	353 17	3,327 03	701 93	109 47
Peterborough.....	66 45	192 75	772 80	3,954 24	231 17
Prescott and Russell.....	729 18	225 65	1,443 51	819 75	458 16
Prince Edward.....	138 14	.....	230 00	91 50	53 07
Renfrew.....	637 11	141 50	2,159 41	1,052 00	776 66
Simcoe.....	.....	.....	7,802 75	3,499 71	739 31
Stormont, Dundas and Glen- garry.....	3,061 08	.....	5,789 54	1,215 22	956 88
Victoria.....	1,035 18	490 10	2,876 24	3,419 18	230 03
Waterloo.....	159 15	211 00	2,181 15	1,296 96	362 55
Welland.....	849 88	1,055 80	4,391 47	56 25	395 97
Wellington.....	482 36	615 31	12,846 93	13,271 50	1,172 55
Wentworth.....	1,674 86	2,147 94	654 50	2,266 20	696 06
York.....	2,584 12	1,486 92	1,722 69	1,615 97	396 10
Totals.....	30,762 29	26,880 38	97,342 18	148,414 54	26,606 25

No. 12

1925

and Repair on County Roads (Revised System)

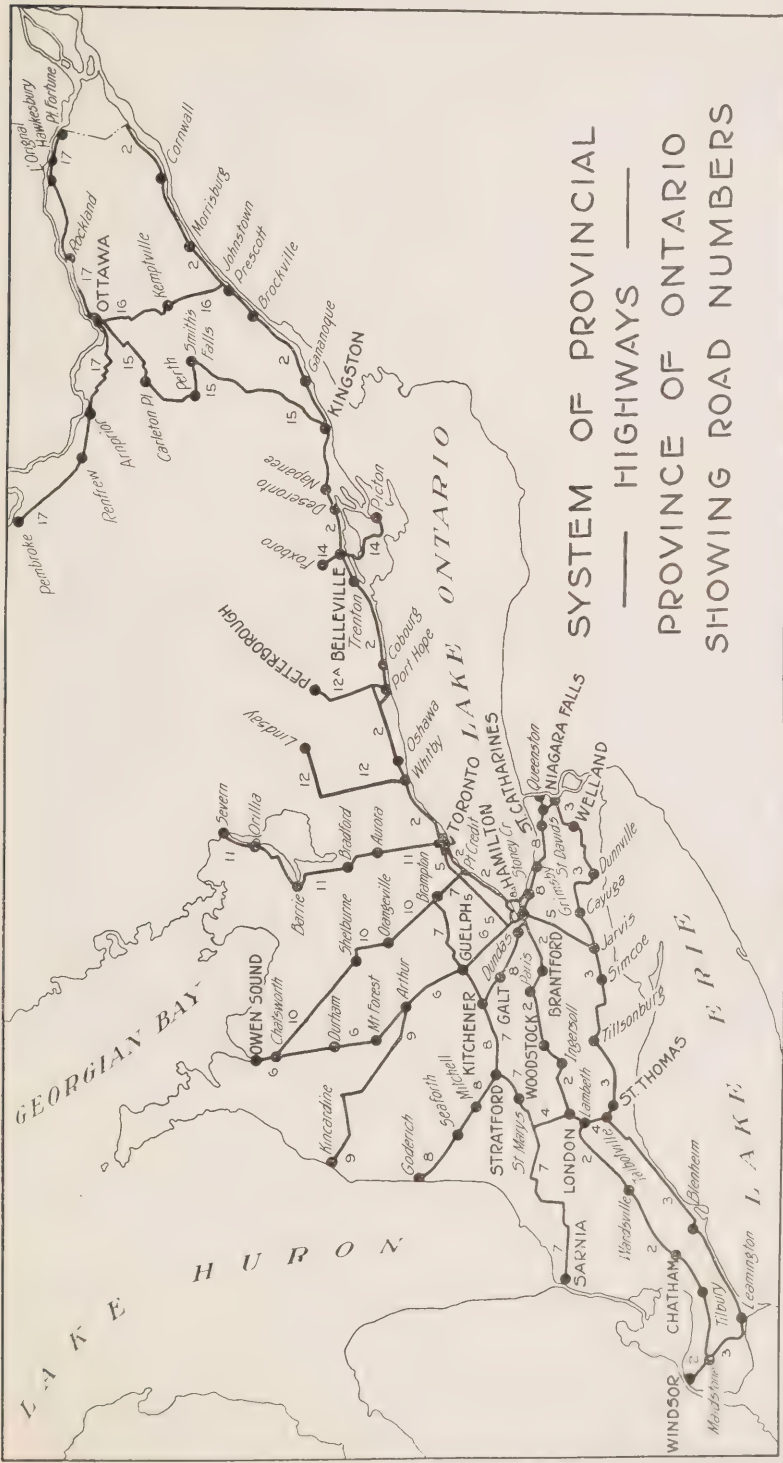
and ending December 31st, 1925.

Bridges (Repairs)	Re-surfacing	Oiling	Snow Roads	Wire Fence Bonus	Total Expenditure	Government Grant, 50%
\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
.....	29,697 49	1,139 61	276 30	{ Guard Rails 623 02 }	40,197 22	20,098 61
526 20	18,405 85	.....	4,295 46	.....	30,752 94	15,376 47
2,374 53	25,564 41	14,345 97	5,636 57	.....	57,049 63	28,524 81
113 51	11,802 44	.....	1,048 64	{ Guard Rails 195 76 }	17,111 20	8,555 60
306 24	46,053 44	3,973 51	1,427 94	.....	67,088 61	33,544 31
2,233 49	85,205 51	2,038 97	.....	.....	108,350 71	54,175 36
.....	10,498 45	15,637 15	505 49	{ Guard Rails 304 46 514 79 }	33,825 35	16,912 67
199 07	13,858 34	505 75	2,633 90	440 90	24,686 64	12,343 32
80 13	14,119 04	.....	676 50	.....	17,785 26	8,892 63
1,818 99	21,987 04	.....	355 02	{ Guard Rails 46 18 }	27,135 02	13,567 51
2,255 45	34,304 05	10,297 22	1,296 10	.....	61,486 83	30,743 42
2,081 57	43,380 04	623 07	3,632 09	{ 3,301 84 Guard Rails 257 41 }	68,596 08	34,298 04
3,809 71	30,202 83	{ 1,346 06 Ferry }	143 20	.....	54,592 39	27,296 19
129 05	32,314 88	589 50	125 38	.....	56,966 73	28,483 37
2,733 04	14,680 64	2,786 99	50 00	7,125 91	34,344 32	17,172 16
455 53	15,224 13	5,488 51	.....	.....	23,118 86	11,559 43
455 57	16,566 73	14,276 83	828 40	272 99	33,222 52	16,611 26
.....	21,938 17	10,721 45	2,199 69	.....	41,326 70	20,663 35
2,104 27	41,771 49	5,087 85	1,514 76	.....	70,897 76	35,448 88
346 08	43,782 53	1,101 39	944 48	{ Guard Rail 61 23 }	54,381 39	27,190 69
319 05	14,392 97	627 35	1,530 35	.....	24,912 96	12,456 48
143 01	18,401 56	2,312 49	2,106 71	1,040 33	31,055 80	15,527 90
836 84	11,910 73	2,496 68	1,562 94	{ Guard Rail 200 16 191 75 }	24,427 75	12,213 87
91 13	12,299 97	4,188 36	10 00	{ Guard Rail 14 22 }	20,955 78	10,477 89
128 43	14,564 07	852 11	2,488 87	.....	22,638 98	11,319 49
2,888 69	13,911 19	100 00	738 46	188 79	23,044 54	11,522 27
.....	3,753 50	8,285 71	1,118 47	.....	16,833 93	8,416 96
173 63	{ 1,490 75 3,261 30 }	16,181 43	1,214 05	.....	22,833 87	11,416 93
588 26	5,017 89	16,568 27	160 85	267 60	27,369 55	13,684 77
747 84	44,924 11	.....	2,706 50	1,621 90	62,042 12	31,021 06
2,932 49	82,789 38	51,330 82	2,966 38	{ Guard Rails 627 94 1,554 80 }	151,669 73	75,834 86
66 13	17,584 39	7,378 89	1,206 60	.....	35,841 54	17,920 77
2,642 38	13,781 93	443 50	2,449 21	.....	23,527 83	11,763 92
397 60	84,386 79	40,842 34	3,075 97	.....	135,452 07	67,726 04
2,306 16	52,821 36	861 93	7,271 90	{ Guard Rails 188 98 }	91,838 98	45,919 49
565 57	8,869 65	7,318 09	4,034 52	.....	28,227 39	14,113 69
294 68	45,685 48	3,878 22	2,941 50	.....	60,605 68	30,302 84
37,144 32	1,021,204 52	253,626 02	65,173 20	19,040 96	1,726,194 66	863,097 31

APPENDIX No. 13
SUMMARY, 1923, 1924 and 1925
Expenditure on Township Roads

The following schedule shows in detail the work and approved expenditure on Township Roads during the years 1923, 1924 and 1925, and upon which Provincial subsidies were paid in 1924, 1925 and 1926, under the provisions of The Ontario Highways Act.

Year	General Expenditure								Superintendence		Total Approved Expenditure	Total Govern- ment Grant
	Number of Town- ships	Roads and Culverts	Bridges	Main- tenance	Machinery	Purchase of Gravel Pits	Approved Expenditure	Governm't Grant 20% and 30%	Approved Expenditure	Governm't Grant 40% and 50%		
1923....	315	\$ 665,101 32 c.	\$ 420,451 17 c.	\$ 1,720,273 23 c.	\$ 82,020 62 c.	\$ 30,453 57 c.	\$ 2,918,299 91 c.	\$ 583,659 65 c.	\$ 75,945 31 c.	\$ 30,378 23 c.	\$ 2,994,245 22 c.	\$ 614,037 88 c.
1924....	320	\$ 725,631 40 c.	\$ 334,348 63 c.	\$ 1,861,036 56 c.	\$ 95,758 21 c.	\$ 12,727 08 c.	\$ 3,029,501 88 c.	\$ 605,900 35 c.	\$ 82,599 41 c.	\$ 33,039 76 c.	\$ 3,112,101 29 c.	\$ 638,940 11 c.
1925....	272	\$ 930,129 31 c.	\$ 249,633 82 c.	\$ 1,720,775 30 c.	\$ 121,874 98 c.	\$ 7,886 11 c.	\$ 3,030,299 52 c.	\$ 906,559 91 c.	\$ 164,146 58 c.	\$ 82,073 38 c.	\$ 3,194,446 10 c.	\$ 988,633 20 c.



SYSTEM OF PROVINCIAL
HIGHWAYS —
PROVINCE OF ONTARIO
SHOWING ROAD NUMBERS

The total mileage of the Provincial Highways System at the end of 1925 was 1861.31, the mileage being divided as follows:

Cement Concrete Pavement	355 miles
Asphaltic Concrete Pavement	175 "
Bituminous Penetration Pavement	139 "
Macadam Roadway	372 "
Gravel Road	820.31 "
Total	1861.31 miles

Report on Provincial Highways

Report upon the work of constructing and maintaining the Provincial Highway System for the years 1923, 1924 and 1925

R. M. SMITH, Chief Engineer of Highways.

DEVELOPMENT OF PROVINCIAL HIGHWAYS

When considering the development of Provincial Highways, a very considerable amount of credit due for their conception must be given to Mr. C. A. Magrath, Chairman of the Hydro-Electric Power Commission. Mr. Magrath as chairman of the Highway Commission in 1914 assisted by his commission made certain recommendations to the Government at that time. These recommendations make interesting reading at a period twelve years later.



Subway paved with asphaltic concrete, eastern entrance to City of Toronto on Interprovincial Highway.

Some of the outstanding recommendations were as follows:—

- First. Appointment of a permanent advisory commission acting without remuneration.
- Second. Appointment of suburban commissions and establishing of suburban areas around cities.
- Third. That provincial assistance should be given on interurban roads.
- Fourth. Special consideration of main markets or county roads.
- Fifth. Assistance to township roads as feeders to main market roads.
- Sixth. Statute labour to be abolished or commuted.

METHOD OF FINANCING RECOMMENDED

In connection with recommendation regarding various classifications as mentioned above, the suggestion was put forward that the Province embark on a definite fifteen years' policy. The work to be done being of a permanent nature, as far as possible provision to be made to ensure efficient maintenance of these roads as they were built. The total capital expenditure proposed over this period to be \$30,000,000, the annual expenditure to be approximately \$2,500,000.

It was also proposed that the Government undertake the development of the Highway Department, adding such engineers, etc., as would be required to thoroughly investigate the general conditions throughout the Province, this investigation to include the study of main highways, feeders to same, available road materials, traffic conditions, etc.

The commission recommended further in their report, that the financing of the various highways they were considering should be as follows:—

Suburban roads: The city thirty per cent.
The county thirty per cent.
The province forty per cent.

Interurban roads to be treated as interurban roads within suburban road areas, but outside of same the county to assume one-third of their cost, the Province to pay two-thirds, providing this amount was less than \$12,000 per mile.

On County or Market Roads—Sixty per cent. to be paid by County, forty per cent. to be paid by Provinces.

On the Township roads or feeders to market roads, it was proposed that the Province assist the municipalities to approximately twenty per cent. of the expenditure on these roads.

In the study of Provincial Highway development from 1914 to the present it is remarkable how closely the recommendations of Mr. Magrath and his assistants have been carried out.

TORONTO-HAMILTON HIGHWAY

During the summer of 1914, the Department's organization was increased very materially, sufficient staff being added to take care of surveys and investigations recommended by the commission. The Toronto-Hamilton Highway coming within the classification of interurban roads was given first consideration, being as it was, the heaviest travelled road in the Province. War was declared, however, while surveys and other investigations were under way, with the result that all work was stopped. The Toronto-Hamilton Highway survey was completed in the winter of 1915, however, as the unemployment situation was sufficiently acute to demand very serious consideration. Later the same winter, work was started on actual construction. This road, 35 miles in length and built of concrete, was constructed generally by day labour and was completed in 1917. No other highway work was undertaken until the end of the war except very necessary maintenance.

PROVINCIAL HIGHWAY ACT, 1917

The Provincial Highway Act was passed in 1917 permitting the Government to designate certain main roads as trunk highways, assuming control of same, including construction and maintenance. The first roads selected were from Toronto to Quebec border, Prescott to Ottawa, Niagara Falls to Hamilton, and Hamilton to London, a total distance of 417.64 miles. Work was commenced on these roads the fall of 1918, directly Armistice was signed, surveys having been completed earlier in the same year. The progress of the work on the roads under construction was fair, the work generally being done by returned men, this class of labour appealing to the unsettled veteran. With the increase in motor traffic, however, it was felt that the progress of the construction was not sufficiently fast, and as a result in the fall of 1919 and the spring of 1920 many contracts were let. In the latter year the Provincial Highway System was also increased to 1,830 miles, the object being to lay out a system of main trunk roads that would reach every important centre in the Province.

PROGRESS OF PROVINCIAL HIGHWAY CONSTRUCTION

Work on the Provincial Highways has been prosecuted with extreme vigour, especially since the year 1920, with the result that the entire system of 1,830 miles is nearing completion. As a matter of fact at the termination of work the fall of 1925, 320.9 miles of concrete, 174.6 miles of asphaltic concrete, 139.2 miles of bituminous penetration, 361.32 miles of macadam and 829.1 miles of gravel road has been built. This amount of construction entailing as it did the expenditure of \$45,970,921.04 over the five years mentioned is far beyond the fondest dreams of the original highway commission, and when we speak of the above expenditure we have the Provincial Highways, only, in mind. The Toronto-Hamilton Highway not being included. While we are considering expenditure, it is possibly not out of place to mention the assistance the Province has received from the Federal Government.

FEDERAL AID

In 1919, the Federal Government voted for highway purposes the sum of \$20,000,000. Of this amount the Province of Ontario was to receive \$5,877,275.00. On the basis of this assistance, the Provincial Government which has previously been paying 70 per cent. of the cost of the Provincial Highways, increased their proportion to 80 per cent. the Federal allowance being used at the rate of 40 per cent. of the cost of the work. The progress made on Provincial Highways was so rapid, however, that the Province had earned their share of the allotment by the end of 1922. Since that time the Province has been obliged to bear 80 per cent. of the cost of all Provincial construction.

CHANGE IN DESIGN AND TYPE OF CONSTRUCTION

Provincial Highway construction has been continuously improving since its inception in 1918. Fortunately the Government adapted the plan of moving slowly at the beginning. The original plan called for an 86-foot right of way irrespective of location, that all grades should be reduced to 5 per cent., that the width of pavement to be 18 feet and the width of grade from shoulder to shoulder 30 feet, the alignment of the road to follow as nearly as possible its original location. The policy of widening to 86 feet in width in the northern and outlying sections of the Province has been discontinued, the Department accepting a 66-foot right-of-way as being adequate to accommodate all public utilities and give plenty of width for roadway for many years to come. Snow is not a serious question on these roads, as it is unlikely that an effort will be made to keep them open for motor traffic for some time. It is also felt that should the time come when the motorist will demand that the road remain open the year round, the construction of a wire fence on the 66-foot line will facilitate the removal of snow as readily as the 86-foot line. The Department also has on these outlying sections a narrower area to maintain as far as weed removal is concerned. Experience has also taught the officials in charge of highway work through traffic census, that heavy trucking is limited almost entirely to the congested areas; that no



Provincial Highway south of Ottawa.

objection can be raised on a large percentage of highways to a 6 or 7 per cent. grade, (the latter, however, is now accepted as the limiting grade). It is also of interest to note at this point, the development in width of pavement. At the commencement of the construction of the Toronto-Hamilton highway with concrete in 1914, a width of 18 feet was considered sufficient to take care of traffic for the lifetime of the pavement. Accidents on this section of highway, as compared with the Toronto-Hamilton highway via Dundas Street, which is 20 feet wide, has clearly indicated the wisdom of constructing the pavement wider, particularly when the cost of the extra width is considerably less than the advantages gained. Appreciating the congestion of suburban limits, the Department has recently constructed the western approach to the city of Hamilton 30 feet wide, the western approach to the city of Toronto 30 feet wide and the eastern approach to Toronto 42 feet wide. Parallel routes have also been located between Toronto and Hamilton to relieve and prevent congestion.

SAFETY OF HIGHWAYS

With an increase in traffic amounting to over 1,000 per cent. on Provincial Highways since 1914, comes the study of the construction of these highways with a view to carrying this traffic

over their surface with safety and with speed. At the time of constructing the Toronto-Hamilton highway, the suggestion that the pavement at curves should have considerable super-elevation, or that the curves should be much flatter or eliminated, would have been received with considerable disfavour. As a matter of fact, many objections were raised to its construction, the stand being that it was built to accommodate a few wealthy motorists who lived either in Toronto or Hamilton. The prejudice felt by many people at that time toward a hard surface road has long since passed. People now demand a high type of road built on safe and sane lines. The Government with the thought of safety in carrying the traffic now on the highways have expended considerable sums of money trying to protect this traffic. Curves have been eliminated as far as possible and where impossible to remove, the pavement has been widened and super-elevated to provide for a speed considerably in excess of that allowed by law. The curves where they still exist are also protected by guardrail and in addition the motorist is warned by symbol signs placed three hundred feet from beginning of curves, indicating the direction of the turn. These symbol signs, not only placed at curves but at cross-roads, intersecting roads, narrow bridges, railroads, etc., have proven their worth and we believe are considered by the motorist as a real help in driving, particularly at night. Protection is also being provided by the widening of heavy fills and the generous construction of guard rail at all dangerous points.

The Government is also making real progress in the elimination of railway level grade crossings. To date four level crossings have been totally removed by the construction of subways and sixteen partially eliminated. In the latter case the Department has by relocating the highway, prevented all provincial traffic from crossing the railway tracks. The programme of the Government at the present time calls for a very considerable expenditure toward the removal of these dangerous crossings. In the meantime, however, through co-operation with the railway companies, wig-wags, electric bells, gates, etc., are being installed to protect the traffic until such time as more permanent construction can be undertaken. At an inter-provincial conference held in Ottawa in December, 1925, the provinces were assured by representatives of the Dominion Government, that consideration would be given to amending the Dominion Railway Act to permit of much greater assistance being secured when grade separation was under consideration through the Grade Crossing Fund.

TYPE OF PAVEMENT VARIES

In the construction of pavement on Provincial Highways, the government has been guided largely by traffic conditions, but the availability of local materials has affected to a considerable extent actual construction. The stand taken by the Department is that use should be made of the local materials and the construction programme is generally prepared having this condition in mind. These materials must of course be properly treated but the results obtained in the past indicate that the Department's policy has been justified.

In conclusion the government has taken the stand on Provincial Highway construction that the class of work will be of such type as will equal that of any province or state in America. In the laying of concrete, asphalt, penetration or macadam pavement, instructions have been issued to get plenty of body into the construction, to build for the future, to build safe roads, to put character and permanency into the work. In this connection the Government owes a vote of thanks to the contractors who have handled the work. Many of the firms who are successful contractors with the Department at the present time, began on highway work within recent years. They have taken a pride in their work, made an honest endeavour to live up to instructions and specifications of the Department. The work will remain as a monument to them for many years to come.

We are sure that the original commission could they spare the time to investigate the Highway Department and its work at the present time would feel a real sense of pride in its accomplishments. The recommendations made by the commission have been carried out with very slight variations. The war interfered with the work for five years but no complaint can be registered against the progress made since 1919. At that time only 42 miles of highway had been completed, whereas to-day nearly 1,000 miles have been built, an average of approximately 150 miles per year. Traffic census and motor car registration indicate that we can expect double present day traffic and 100 per cent. increase in motor car registration by 1931. Additional highways must be built to carry this traffic and avoid congestion. The indications are that the Department can expect to build at least an average of 175 miles of Provincial Highway at a total outlay of approximately \$10,000,000 per annum for many years to come.

The last Government report on the Provincial Highways published in 1923, dealt with the Provincial Highways from their inauguration in 1917 up to the end of the 1922 construction period, during which time the work consisted for the most part of culvert construction and grading operations.

1923

In 1923 upwards of 750 culverts were constructed or extended to suit the widened road surface, also 17 new bridges were erected and a mileage in excess of 350 miles of new grading was completed, about 46 miles of cement concrete pavement was laid, 65 miles of asphaltic concrete was laid on 6-inch concrete base, asphaltic black base or macadam base, 15 miles of bituminous penetration macadam and 114 miles of two-course macadam roadway and macadam base. On

the sections of the Highways not under construction, systematic methods of maintenance were continued. Gravel surfaces received applications of new gravel where required and were constantly dragged and macadam surfaces were given a surface coat of road oil or refined tar.

During 1923 asphaltic concrete pavement was laid on Dundas Street from just west of Cooksville to Clappison Corners and south from Clappison's Corners to Hamilton was paved with concrete; this completed the hard surface between Toronto and Hamilton via Dundas Street. Between Port Credit and Cooksville an asphaltic concrete pavement was laid connecting the Hamilton Highway and Dundas Street.

The pavement on Yonge Street was extended north from Toronto as far as Richmond Hill.

Concrete pavement was laid between Brantford and Paris and also between Ingersoll and Woodstock, and an important piece of concrete was laid on the Burlington Beach Road from the Brant House.

A very important piece of construction was the subway at Binkley's Corners and with the several small concrete sections laid at the Subway and Dundas entrance completed the pavement between Kitchener and Hamilton.



Subway south of Aurora on Toronto-Severn Provincial Highway, paved with asphaltic concrete

Extensive grading operations were done between Guelph and Brampton and the Norval Bridges started. Also the section from Barrie to Severn Bridge was graded and gravel or macadam surface was applied throughout. Grading was completed between Arthur and Kincardine with the exception of a short section north of Mildmay, also the grading from Ottawa to Pembroke, excepting short sections at Carp and Renfrew. Grading and surface gravelling was carried out from Stratford to Pavement east of Sarnia.

Hamilton and Niagara Falls were connected up with a hard surface road, also hard surface was completed between Deseronto and Gananoque.

A detailed schedule of construction is given in Appendix 14 and schedules of expenditures by counties, cities and separated towns in Appendices Nos. 17, 18 and 19.

1924

In 1924, 50 culverts were constructed and extensions were added to many existing culverts that were too narrow, also 13 bridges were built; about 70 miles of new grading was completed; a very considerable mileage of hard surface was laid; 70 miles of cement concrete pavement in the construction of this type of pavement wayside pits were largely used; 19 miles of asphaltic

concrete, nearly all on a 6-inch concrete base; 26 miles of bituminous penetration pavement and over 70 miles of two-course waterbound macadam. Systematic maintenance operations were carried on throughout the whole Highway System during the year.

During the 1924 construction season the Humber River Bridge was completed and the western approach to the City of Toronto was paved and opened for traffic. On the Kingston Road, asphaltic concrete pavement was laid between Oshawa and Bowmanville and 4 miles of cement concrete pavement from Belleville easterly. Concrete pavement was laid westerly from Lambeth to Delaware and also $11\frac{1}{4}$ miles of concrete from Ingersoll westerly, which, with the exception of 6 miles west of Paris, made a continuous stretch of pavement from Hamilton through London to Delaware Village.

Concrete pavement was laid between New Hamburg and Shakespeare and the gap between Kitchener and Petersburg completed, so that with the exception of 6 miles east of New Hamburg, hard surface is continuous from Kitchener to Mitchell.

Construction of $5\frac{1}{4}$ miles of cement concrete south from Essex made the concrete pavement continuous from Windsor to Cottam, a distance of over 20 miles.



Asphaltic concrete pavement near Tansley on the Dundas Provincial Highway.

A two-course waterbound macadam, laid from Caledonia to Jarvis, completed the hard surface from Hamilton to Jarvis. Twenty miles of macadam were laid between Wendover and Hawkesbury on the Ottawa-Point Fortune Road which made the hard surface continuous from Ottawa to Hawkesbury.

A detailed schedule of construction is given in Appendix No. 15, and the schedules of expenditures by counties, cities and separated towns in Appendices Nos. 17, 18 and 19.

1925

In 1925 an extensive programme of construction was carried out on the Provincial Highway System and at the same time a greatly increased programme of maintenance was underway. All the gravel roads throughout the system were renewed where necessary and continuous dragging operations were carried out, also gravel dust layer and calcium chloride was used to allay the dust nuisance. Over 200 miles of macadam roadway was surface treated partially by contract and the balance by day labour. Extensive weed cutting operations, shoulder maintenance, patching of hard surface roads, tile drainage construction and guard rail erection were among the varied types of maintenance work carried out on the various residences of the Highway System.

An important feature of Provincial Highway work lay in the fact that all the Provincial Highways were numbered and numerous signs placed at vantage points along the route.

Symbol signs indicating cross-roads, curves ordinary and reverse were placed three hundred feet in advance of all points affected.

The construction work done in the 1925 construction season may be briefly summarized as follows:

Fourteen and one-half miles of asphaltic concrete pavement were laid; 123 miles of cement concrete pavement; 41 miles of bituminous penetration pavement and about 29 miles of waterbound macadam. About 46 miles of new grading was carried through and 35 culverts or extensions to culverts were constructed, also 10 new bridges were erected and construction was started on several others.

Asphaltic concrete pavement was laid from west of Welland westerly along the Grand River for a distance of 6 miles, and also between Caledonia and Mount Hope and a short section east of Niagara Falls. On these contracts asphaltic black base was used with an asphaltic concrete top. A very important feature of the year's operations was the paving of the Danforth Subway and a section on the Danforth immediately adjacent to the City of Toronto allowing Bloor Street and Danforth Avenue to be opened through to the Kingston Road. On these short sections asphaltic concrete on a 6-inch concrete base was laid.

Cement concrete pavement was laid from Strathburn to Delaware, a distance of 18½ miles, and also in the gap 6 miles west of Paris. The paving of these two sections completes the paving between Hamilton and Strathburn, a distance of 102 miles. On the Windsor-Leamington Road 5 miles of concrete were laid south from Cottam leaving less than 5 miles for a complete concrete pavement from Windsor to Leamington.

On the Longwoods Road, 9¼ miles of cement concrete were laid westerly from Thamesville and 7¼ miles westerly from Ruscom, and as 4 miles of macadam were built during the year west of Tilbury, with the exception of a 7¾ mile gap between Ruscom and Comber, there is continuous hard surface between Windsor and Thamesville through Chatham. On the Talbot Road, nearly 7 miles of concrete was laid between Talbotville and Shedden. With the exception of 3 miles north of St. Mary's there is continuous concrete between St. Mary's and Stratford. East of the pavement east of Sarnia an additional 7 miles of cement concrete was laid, so that there is now 13½ miles of concrete pavement east from Sarnia. From a point 4 miles south of Guelph 7½ miles of concrete were laid which made the pavement between Hamilton and Guelph continuous.

On the Kingston Road, concrete pavement was constructed east from Bowmanville, east from Newtonville, sections between Cobourg and Port Hope, Port Hope westerly, Cobourg easterly and east of Trenton, an additional mileage of slightly over 23 miles, leaving only 31 miles of road between Toronto and Belleville unpaved. Concrete pavement was laid both east and west of Prescott for a total distance of 8 miles. On the Ottawa-Prescott Road, concrete pavement was laid at Kemptville and north to the Rideau, at North Gower and Manotick, in all, about 7¾ miles and except for the section from the Rideau River to North Gower, a distance of about 8 miles, there is continuous pavement from Ottawa to Kemptville. On over 75 per cent. of the cement concrete pavement construction the material used was obtained from wayside pits or local quarries.

Bituminous penetration pavement was largely laid with a levelling-up course of stone on which after consolidation, a 3-inch consolidated penetrated top is placed. Sections of this type of road were laid between Green's Creek and Orleans, L'Orignal westerly 5 miles and Wendover westerly on the Ottawa-Point Fortune. Bituminous macadam was also laid on the St. Lawrence River Road both east and west of Brockville and at Morrisburg. On the portion of the Highway System west of Toronto a short section of bituminous macadam was laid east from Tillsonburg, and also a 2½ mile section at Chamber's Corners. Between Mitchell and Sebringville a penetration course was built on the existing macadam. South from Brampton 5 miles of bituminous macadam were laid, which makes a continuous bituminous macadam pavement from Cooksville to Brampton.

Waterbound macadam roadway laid in two courses was constructed west from Moulinette about 4½ miles, west from Quebec Boundary and at Summerstown, also 7½ miles of macadam were laid between Shannonville and Marysville. The completion of these sections makes a continuous hard surface road from Belleville easterly to the Quebec Boundary. There were also several short sections of macadam constructed on the Belleville-Picton Road, north from Bloomfield and at Crofton. Macadam was also laid south from Arthur and west from Tilbury.

The grading done in 1925 consisted for the most part of light grading, a considerable mileage of road being graded on the basis of so much per mile. The most important grading operation was the cutting at the west entrance to Tillsonburg. Several bridges and culverts were constructed over the Gullys on the Talbot and Longwoods roads. A new alignment and an artistic concrete structure over the Grand River at Freeport was nearing completion at the close of 1925 construction season. These operations greatly improved the road between Kitchener and Galt. An important bridge on the Ottawa-Point Fortune Road at Plantaganet across the Nation River was started at the close of 1925.

A detailed schedule of construction is given in Appendix No. 16 and schedules of expenditures by counties, cities and separated towns in Appendices Nos. 17, 18 and 19.

BRIDGES

During the years 1923, 1924 and 1925 covered by this report, the bridge building programme was of a very extensive nature, there being 59 structures completed and opened for traffic during these three years, this number representing slightly more than 50 per cent. of the bridges reconstructed on the Provincial Highway System. During the year 1923 there were completed some 25 bridges amongst which might be mentioned new steel structures at Erindale and Waterdown and a new overhead crossing of the Canadian Pacific Railway at the foot of the Clappison's Cut. These three bridges replaced some very poor structures and in the case of Clappison's bridge removed a very crooked alignment over the railroad. There was also completed during this year a reinforced concrete bridge at Markdale, this being the second concrete bridge built on the Provincial System. Binkley's subway was also built and opened in this year. The outstanding bridge completed during 1924 was the Humber River Bridge on Bloor St., just west of the City of Toronto. This structure completed the entrance of the Dundas St. Highway from Hamilton and opened this road as an important factor in the intercity traffic. The structure itself is the most elaborate on the Provincial System and has a total length of 745 feet being composed of four steel arch spans and two approach spans supported on concrete pedestals and abutments and carrying a concrete deck sixty feet wide between the concrete handrails. The Grand River bridge at Cayuga was also completed this year. This structure is composed of five steel spans and replaced an old iron bridge that was not only unsafe but entirely unsuited for present day traffic.



Bloor Street Bridge over Humber River, Western Toronto Entrance, Dundas Provincial Highway.

In 1924 concrete was adopted for use on all bridges for which this type of construction was suitable and in this year there were constructed ten reinforced concrete structures with spans varying from 27 feet to 115 feet. In 1924 the Bloor St. east subway was opened thus providing an entrance to the City of Toronto for the eastern Provincial Highway.

The construction during 1925 was somewhat lighter than previous years there being eleven bridges completed during this year which were for the most part of reinforced concrete. Special mention might be made of two concrete bridges built between Chatham and Tilbury over drainage ditches and of a third one which straightens out a very bad crossing over a large municipal drain and which will be completed in 1926. During 1925 construction was started on a concrete bridge at Delhi and also on a bridge over the Grand River at Freeport. This structure is composed of seven similar reinforced concrete trusses with a total length of 500 feet, and it is expected to have this structure open for traffic early in 1926. Construction was also started on two bridges in the village of Plantagenet on the Ottawa-Point Fortune Road. The larger of these two is composed of two spans each 115 feet long this being the longest span built to date by the department with reinforced concrete.

A schedule of bridges completed on Provincial Highways during 1923-24-25 will be found in Appendix No. 20.

APPENDIX

DETAILS OF CONSTRUCTION—

County	Culverts Built	Bridges Built	Miles of Grading	Miles of Gravelling	Miles W.B. 2- Course Macadam
Brant.....				7.85	
Bruce.....	65 and 5 ext.	3	18.9	23.4	
Carleton.....	14		10.2	10.9	3.7
Dufferin.....	14 and 3 ext.			9.3	
Dundas, Stormont and Glengarry..	31		12.2	3.7	
Durham and Northumberland....	1		7.85	5.35	
Elgin.....				11.0	
Essex.....	11		15.7	21.5	
Frontenac....	1		6.6		6.6
Grey.....	145 and 2 ext.		20.1	17.9	1.1
Haldimand.....		2	9.38		
Halton.....	21	3	3.6	8.35	
Hastings.....	34		1.2		4.15
Huron.....	4		14.3	11.5	
Kent.....	25		4.4	52.0	
Lambton.....	27		13.85	26.15	
Lanark.....	39		18.3		
Leeds and Grenville.....	35		8.5	8	
Lennox and Addington.....	3		5.2		4.5
Lincoln.....	14		2.28		
Middlesex.....	63	1	23.72	12.8	
Norfolk.....	2		10.7	6.0	
Ontario.....	20		10.9	10.7	
Oxford....				3.75	
Peel.....	1	2	18.35	22.35	
Perth..	2		7.4	14.05	4.15
Peterborough..					
Prince Edward.....	9		4.65	0.2	7.0
Renfrew.....	35		21.3	19.6	
Russell and Prescott.....	25		14.5	6.9	10.5
Simcoe.....		3	12.55	5.4	5.3
Victoria....			4.7	4.7	
Waterloo.....	2			10.5	
Welland.....	13		8.85		
Wellington.....	80 and 16 ext.	1	22.54	35.16	5.8
Wentworth.....		1	16.27		
York.....	1	1	13.55		.30

No. 14

1923

PROVINCIAL HIGHWAYS

Miles Bit. Penetra- tion	Miles Asp. Concrete	Miles Concrete Pavement	Lin. Ft. Guard Rail	Lin. Ft. Storm Sewers	Miles Surface Treatment	Miles Gravel Rd. Maint.	Miles of New Fence Erected
		5.1	11,828		0.5	6.66	3.0
			10,560			38.7	8.9
	15.2		3,600		9.4		14.2
			600			24.5	7.05
			19,008	7,392	21.4	9.3	19.6
			11,000	300		82.48	7.45
		4.0				50.0	40.5
		6.5				52.74	34.75
					3.5	8.5	21.2
					3.5	65.4	42.8
			440				24.33
	14.65		6,340			13.46	10.18
			600	1,000	6.1	18.2	9.8
						29.03	1.2
		3.4				77.87	54.9
			3,662			37.76	71.52
					21.6		20.2
		2.95	9,504	4,224	2.0	24.97	3.2
0.7					8.7		9.3
		2.0	10,392				20.81
		3.3	12,987			85.62	64.55
					3.0	21.5	0.9
		8.1		2,800		35.07	30.0
		7.2	2,236		7.3	11.25	6.4
	6.83		2,434	2,640		27.6	35.1
	3.6		6,185		5.15	36.03	20.5
			1,200				2.7
0.8				1,000	5.6	9.33	13.2
					2.4		25.2
			6,860		5.1	3.5	
4.68			42			37.10	22.38
						12.7	20
		4.9	4,084			17.40	
		1.22	221				
			7,108		4.0	62.15	27.82
8.45	10.14	7.38	15,730	9,134			17.78
	13.7		3,155				11.48

APPENDIX

DETAILS OF CONSTRUCTION—

County	Culverts Built	Bridges Built	Miles of Grading	Miles of Gravelling	Miles W.B. 2- Course Macadam
Brant.....		½	0.16		
Bruce.....	7		3.8	28.6	0.8
Carleton.....	2		2.9	53.4	2.3
Dufferin.....			6.3	13.3	
Dundas, Stormont and Glengarry.....					7.5
Durham and Northumberland.....				7.0	
Elgin.....	1	1			
Essex.....			2.1	34.9	
Frontenac.....					
Grey.....	9	1	12.7	28.2	
Haldimand.....	2	2	4.30		12.00
Halton.....			3.7	2.6	
Hastings.....		1	2	6.75	1.5
Huron.....		1	3.45	2.35	
Kent.....				63.35	9.3
Lambton.....		½	0.1	0.1	
Lanark.....			3.5		3.0
Leeds and Grenville.....					
Lennox and Addington.....					
Lincoln.....			0.63		
Middlesex.....		½		0.45	
Norfolk.....	2 ext.	1			
Ontario.....		1	.50		
Oxford.....		½	0.16		
Peel.....	7 and 1 ext.	1	2.8	19.9	
Perth.....		1	4.6	4.6	
Peterborough.....					
Prince Edward.....			5.6		1.7
Renfrew.....	6		2.0	43.5	
Russell and Prescott.....	2		0.3	10.2	21.2
Simcoe.....				2.4	
Victoria.....	1		0.1	4.0	
Waterloo.....					
Welland.....			2.95		5.90
Wellington.....	6 and 3 ext.	1	2.7	27.8	5.5
Wentworth.....					
York.....	7		1.73		0.4

No. 15

1924

PROVINCIAL HIGHWAYS

Miles Bit. Penetra- tion	Miles Asp. Concrete	Miles Concrete Pavement	Lin. Ft. Guard Rail	Lin. Ft. Storm Sewers	Miles Surface Treatment	Miles Gravel Rd. Maint.	Miles of New Fence Erected
2.0		1.0	4,392			5.66	
			1,675			37.9	1.55
	2.3	1.9	16,500	30	11.9	18	2.0
						24.5	0.1
	1.0			7,392	42.5	9.3	
	6.33	4.25				7.19	0.6
		4.4	23,970			45.6	
		10.7	1,252 35	850		42.04	
					18.4	8.5	
		4.0	4,502		3.5	65.4	4.6
			3,338		51.20		0.15
			12,640			13.46	
0.6		4.15	600		8.8	12.55	0.35
			6,134			29.03	
			6,260.1		6.49	68.57	1.7
		4.35	6,345			33.41	
					36.5		
1.4					9.0	62.87	
					20.0		
		0.30	2,432		7.4		
		12.6	9,500	2,500		73.02	
			3,550		1.0	27.5	
	1.52		1,600			33.55	
8.8		8.0				1.54	
3.9			8,086		5.1	27.6	1.1
		11.35	3,500		7.25	17.43	
					9.2		
			500		12.8	7.63	3.7
			15,180			87.4	3.0
2.2			7,325		28.5	11.2	0.2
2.7			8,464			37.10	
						12.7	
		2.95	3,439			14.45	
	4.5		2,647		12.30		
			766		5.3	58.65	
			12,950		2.95		
4.1	3.43		6,310				

APPENDIX

DETAILS OF CONSTRUCTION—

County	Culverts Built	Bridges Built	Miles of Grading	Miles of Gravelling	Miles of W. B. 2-course Macadam
Brant.....					
Bruce.....				15.9	
Carleton.....	7		1.9	15.3	
Dufferin.....				0.4	
Dundas, Stormont and Glengarry.....					10.1
Durham and Northumberland.....				11.0	
Elgin.....		1	2.5		
Essex.....	1	1		17.2	3.8
Frontenac.....					
Grey.....	2 & 1 ext.		9.1	31.2	
Haldimand.....		1			
Halton.....					
Hastings.....					7.52
Huron.....			1.7	1.7	
Kent.....	4	3	2.5	56.7	
Lambton.....					
Lanark.....					
Leeds and Grenville.....					
Lennox and Addington.....					
Lincoln.....					
Middlesex.....		1 & 4 ext.	1.0	1.0	
Norfolk.....	2 ext.	1			
Ontario.....				19.6	
Oxford.....	2		1.25		
Peel.....			0.35	9.3	
Perth.....				5	
Peterborough.....					
Prince Edward.....		*Spans 3 & 4			3.74
Renfrew.....	14		3.7	21.5	
Russell and Prescott.....			1.5	11.2	
Simcoe.....					
Victoria.....					
Waterloo.....	2	1	0.35	0.85	
Welland.....			3.0		
Wellington.....			7.0	28.85	3.6
Wentworth.....		1			
York.....			0.5		

*Belleville Bay Bridge.

No. 16

1925

PROVINCIAL HIGHWAYS

Miles of Bit. Penetration	Miles of Asp. Concrete	Miles of Concrete Pavement	Lineal Feet Guard Rail	Lineal Feet Storm Sewers	Miles of Surface Treatment	Miles of Gravel Rd. Maintenance	Miles of New Fence Erected
		5.16	1,128		2.0	0.5	
			6,898		0.8	37.8	
3.6		5.93	1,155		3.5	48.74	0.5
			920		0.4	24.5	
0.3			1,250		8.3	6.1	
		19.9	3,120			52.0	
		6.8	11,920			38.8	3.2
		12.35	5,659.5			25.89	
			100			8.5	
			4,595		3.5	61.4	1.8
1.05	2.7		4,086		34.90		
			6,340			13.46	
		4.71			4.5	0.32	
			144			29.03	
		8.8	6,963		7.0	56.27	0.5
		6.91	786			26.50	
			2,400		0.5		
4.3		9.86	450			62.87	
0.33			2,396		4.7		
		21.0	12,083			52.02	1.0
4.5			500			26.0	
		2.55	1,040			31	1.4
1.25		1.04	910		2.0		
4.9			7,782			21.1	1.75
7.25		2.5	236		1.80	14.90	
					8.7	3.89	
2.5			990			55.8	3.1
8.8			4,290		38.80	11.2	
			42			37.10	
		0.9		100		12.0	
		5.75	1,548			8.7	
2.4	7.42	0.18	9,858		9.6		
		7.75	9,237		17.0	48.5	
0.05	2.95		5,516				1.38
	1.28	1.35	3,155				

APPENDIX No. 17
Expenditures on Provincial Highways, 1923, 1924 and 1925

	Construction	Maintenance	Total Expenditure	Cost to Province	Cost to County	Cost to Separated Towns	Cost to Cities (Sub Area)
	\$	\$	\$	\$	\$	\$	\$
1923	175,471 65	13,117 11	188,588 76	118,545 47	37,717 75		32,325 54
1924	84,067 10	10,387 52	94,454 62	73,575 35	18,890 92		1,988 35
1925	117,027 28	9,925 20	126,952 48	99,842 53	25,390 50		1,719 45
1923	172,946 73	4,583 08	177,529 81	142,023 85	35,505 96		
1924	44,611 87	23,683 58	68,295 45	54,636 36	13,659 09		
1925	5,483 97	12,969 23	18,453 20	14,762 56	3,690 64		
1923	647,875 17	29,404 68	677,279 85	*459,569 59	135,455 97		82,254 29
1924	175,426 54	60,877 42	236,303 96	156,067 45	47,260 79		32,975 72
1925	268,902 23	32,119 80	301,022 03	208,777 24	60,204 41		32,040 38
1923	69,758 39	4,951 27	74,709 66	59,767 73	14,941 93		
1924	13,589 06	10,056 21	23,645 27	18,916 22	4,729 05		
1925	1,484 83	9,741 12	11,225 95	8,980 76	2,245 19		
1923	223,482 89	39,308 13	262,791 02	210,232 82	52,558 20		
1924	167,792 80	53,682 08	221,474 88	177,179 91	44,294 97		
1925	127,738 78	25,077 59	152,816 37	122,253 09	30,563 28		
1923	84,210 86	69,374 12	153,584 98	122,867 98	30,717 00		
1924	307,271 12	68,335 67	375,606 79	300,485 45	75,121 34		
1925	445,582 14	43,667 67	489,249 81	391,399 83	97,849 98		
1923	256,551 38	18,684 56	275,235 94	191,799 45	55,047 19		28,389 30
1924	123,926 66	35,689 07	159,615 73	102,074 69	31,923 14		25,617 90
1925	260,802 69	32,974 77	293,777 46	225,024 31	58,755 49		9,997 66
1923	240,419 65	11,570 13	251,989 78	174,546 75	50,397 96		27,045 07
1924	339,046 32	37,694 57	376,740 89	299,890 41	75,348 17		1,502 31
1925	460,050 34	24,351 36	484,401 70	386,733 25	96,880 34		788 11
1923	130,824 94	27,729 07	158,554 01	126,843 21	31,710 80		
1924	759 83	25,679 06	26,438 89	19,008 00	5,287 78		2,143 11
1925	433 89	18,239 74	18,673 63	14,092 16	3,734 73		846 74
1923	259,200 65	18,263 08	277,463 73	214,015 19	55,492 74		7,955 80
1924	159,507 14	22,325 37	181,832 51	129,550 66	36,366 50		15,915 35
1925	33,860 50	27,520 89	61,381 39	48,879 07	12,276 28		226 04
1923	290,606 99	25,798 64	316,405 63	253,124 50	63,281 13		
1924	274,302 58	39,690 62	313,993 20	251,194 56	62,798 64		
1925	121,019 51	57,334 97	178,354 48	142,683 59	35,670 89		
1923	708,267 25	1,715 36	709,982 61	567,986 09	141,996 52		
1924	158,532 09	14,080 01	172,612 10	138,089 68	34,522 42		
1925	5,882 49	18,919 67	24,802 16	19,841 73	4,960 43		

APPENDIX No. 17—Continued
Expenditures on Provincial Highways, 1923, 1924 and 1925

	Construction	Maintenance	Total Expenditure	Cost to Province		Cost to County	Cost to Separated Towns		Cost to Cities (Sub. Area)	
	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
Prince Edward.....	1923 200,082 76	11,077 23	211,159 99	168,928 00	42,231 99					
1924 47,660 08	18,014 38	65,674 46	52,539 56	13,134 90						
1925 93,835 34	16,236 11	110,071 45	88,057 16	22,014 29						
Renfrew.....	1923 163,909 37	4,456 91	168,366 28	134,693 02	33,673 26					
1924 28,476 77	22,654 54	51,131 31	40,905 06	10,226 25						
1925 61,073 91	19,519 97	80,593 88	64,475 11	16,118 77						
Russell and Prescott.....	1923 265,901 28	14,701 01	280,602 29	224,481 84	56,120 45					
1924 233,383 20	53,325 83	286,709 03	229,367 22	57,341 81						
1925 175,946 76	53,866 89	229,813 65	183,850 92	45,962 73						
Simcoe.....	1923 320,021 17	36,086 89	356,108 06	284,886 45	71,221 61					
1924 90,552 34	51,925 34	142,477 68	113,982 14	28,495 54						
1925 43,441 85	75,392 78	118,834 63	95,067 70	23,766 93						
Victoria.....	1923 41,997 96	7,993 34	49,991 30	39,993 04	9,998 26					
1924 4,363 23	14,695 19	19,058 42	15,246 73	3,811 69						
1925 24,957 14	3,045 69	28,002 83	22,402 26	5,600 57						
Waterloo.....	1923 162,268 17	4,643 38	166,911 55	104,344 87	33,382 31					29,184 37
1924 117,002 43	14,754 47	131,756 90	98,518 29	26,351 38						6,887 23
1925 187,178 73	10,357 04	197,535 77	143,987 83	39,507 15						14,040 79
Welland.....	1923 208,609 97	4,368 01	212,977 98	133,012 02	42,595 54					17,370 42
1924 242,278 89	21,126 44	263,405 33	191,130 94	52,681 07						19,593 32
1925 442,331 84	29,851 99	472,183 83	352,558 22	94,436 77						25,188 84
Wellington.....	1923 319,326 41	18,759 45	338,085 86	266,896 83	67,617 17					3,571 86
1924 110,616 88	53,785 07	164,401 95	128,739 82	32,880 39						2,781 74
1925 258,856 82	48,564 58	307,421 40	244,756 09	61,484 28						1,181 03
Wentworth.....	1923 1,148,048 31	29,167 12	1,177,215 43	773,227 72	235,444 08					168,544 63
1924 87,969 32	36,523 79	124,493 11	77,511 40	24,898 62						22,083 09
1925 98,010 20	39,204 45	137,214 65	99,944 37	27,442 93						9,827 35
York.....	1923 1,047,602 72	20,581 48	1,068,184 20	458,210 42	213,636 84					396,336 94
1924 656,639 99	21,047 85	677,687 84	365,881 73	135,537 56						176,268 55
1925 184,050 10	21,684 24	205,734 34	92,899 08	41,146 78						71,688 39
Indian Reserve.....	1923 706 06	5,827 52	6,533 88	5,227 11						
1924 289 42	3,163 49	3,452 91	2,762 33							
1925 10 12	957 66	967 78	774 23							
Total for three years..	21,713,623 63	2,816,909 24	24,530,532 87	18,102,010 05	4,893,346 26					1,522,416 43

APPENDIX No. 18
EXPENDITURE ON PROVINCIAL SUBURBAN AREAS, 1923-4-5

		Construction	Maintenance	Total Expenditure	Proportion Paid by Cities
		\$ c.	\$ c.	\$ c.	\$ c.
Belleville.....	1923	30,565 54		30,565 54	8,009 43
	1924	60,804 54	9,430 36	70,234 90	14,046 98
	1925	49,367 44	5,635 43	55,002 87	11,000 58
Brantford.....	1923	161,627 73		161,627 73	32,325 54
	1924	5,470 30	4,471 44	9,941 74	1,988 35
	1925	1,253 29	7,343 97	8,597 26	1,719 45
Chatham.....	1923	141,214 25		141,214 25	28,242 85
	1924	132 30	1,396 97	1,529 27	305 85
	1925	149 53	1,098 49	1,248 02	249 61
Galt.....	1923	28,119 90		28,119 90	5,623 98
	1924	240 08	1,052 75	1,292 83	258 55
	1925		855 09	855 09	171 02
Guelph.....	1923	17,859 31		17,859 31	3,571 86
	1924	9,045 64	4,863 05	13,908 69	2,781 74
	1925	557 48	5,347 64	5,905 12	1,181 03
Hamilton.....	1923	842,723 18		842,723 18	168,544 63
	1924	78,248 81	32,166 61	110,415 42	22,083 09
	1925	16,552 37	32,584 38	49,136 75	9,827 35
Kingston.....	1924	547 77	10,167 80	10,715 57	2,143 11
	1925	226 96	4,006 75	4,233 71	846 74
Kitchener.....	1923	117,801 98		117,801 98	23,560 39
	1924	24,498 69	8,644 73	33,143 42	6,628 68
	1925	65,218 93	4,129 92	69,348 85	13,869 77
London.....	1923	133,770 04		133,770 04	26,754 01
	1924	188,191 73	12,813 68	201,005 41	40,201 08
	1925	100,785 29	6,389 75	107,175 04	21,435 01
Niagara Falls.....	1923	25,328 47		25,328 47	5,065 69
	1924	76,508 34	8,482 83	84,991 17	16,998 24
	1925	86,333 98	5,340 70	91,674 68	18,334 94
Ottawa.....	1923	411,271 46		411,271 46	82,254 29
	1924	141,344 61	23,533 99	164,878 60	32,975 72
	1925	148,328 01	11,873 88	160,201 89	32,040 38
Owen Sound.....	1923	39,779 00		39,779 00	7,955 80
	1924	76,335 39	3,241 39	79,576 78	15,915 35
	1925	Cr. 1,969 12	3,099 34	1,130 22	226 04
Peterboro.....	1923	9,662 44		9,662 44	1,932 49
	1924	488 81	2,797 20	3,286 01	657 20
	1925	365 47	1,476 91	1,842 38	368 47
Sarnia.....	1923	6,308 05		6,308 05	1,261 61
	1924	87,645 92	895 88	88,541 80	17,708 36
	1925		688 59	688 59	137 72
St. Catharines.....	1923	16,827 61		16,827 61	3,365 52
	1924		4,374 74	4,374 74	874 95
	1925	4,162 36	13,655 60	17,817 96	3,563 59
St. Thomas.....	1923	141,946 82		141,946 82	28,389 30
	1924	125,636 93	2,452 25	128,089 18	25,617 90
	1925	44,811 20	5,177 08	49,988 28	9,997 66
Stratford.....	1923	163,622 13		163,622 13	32,724 43
	1924	67,053 04	1,500 69	68,553 73	13,710 75
	1925		1,290 00	1,290 00	258 00
Toronto.....	1923	1,981,684 70		1,981,684 70	396,336 94
	1924	840,944 86	40,406 84	881,351 70	176,268 55
	1925	327,090 32	31,351 67	358,441 99	71,688 39
Welland.....	1923	61,523 66		61,523 66	12,304 73
	1924	8,798 81	4,176 62	12,975 43	2,595 08
	1925	23,747 75	10,521 76	34,269 51	6,853 90
Windsor.....	1923	135,225 35		135,225 35	27,045 07
	1924	5,510 96	2,000 59	7,511 55	1,502 31
	1925	1,870 44	2,070 11	3,940 55	788 11
Woodstock.....	1923	88,939 34		88,939 34	17,787 87
	1924	27,354 11	1,727 32	29,081 43	5,816 29
	1925	17,897 77	722 82	18,620 59	3,724 11
Total of three years.....		7,267,352 07	335,257 61	7,602,609 68	1,522,416 43

APPENDIX No. 19

EXPENDITURE ON PROVINCIAL HIGHWAY CONNECTING LINKS IN SEPARATED TOWNS, 1923-4-5

		Construction	Maintenance	Total Expenditure	Town's Proportion
		\$ c.	\$ c.	\$ c.	\$ c.
Gananoque.....	1923	1,134 08	2,143 36	3,277 44	655 49
	1924	.....	1,435 75	1,435 75	287 15
	1925	.....	68 44	68 44	13 69
Ingersoll.....	1923	1 25	.....	1 25	25
	1924	9,530 17	240 71	9,770 88	1,954 18
	1925	3,825 25	.....	3,825 25	765 05
St. Mary's.....	1923	4,366 87	220 76	4,587 63	917 53
	1924	157 75	60 26	218 01	43 60
	1925	.....	.....	.....	.....
Trenton.....	1923	29,580 66	80 81	29,661 47	5,932 29
	1924	.....	.....	.....	.....
	1925	.....	.....	.....	.....
		48,596 03	4,250 09	52,846 12	10,569 23

APPENDIX No. 20

BRIDGES COMPLETED ON PROVINCIAL HIGHWAYS DURING 1923-24-25

Name of Bridge	Span ft. in.	Com- pleted	Road No.	Township	County
Erindale Bridge.....	124 6	1923	5	Toronto.....	Peel.
Waterdown Bridge.....	113 0	1923	5	E. Flamboro.....	Wentworth.
	(3 spans)				
Green's Creek.....	52 0	1923	17	Gloucester.....	Carleton.
Severn River.....	56 0	1923	11	Orillia.....	Simcoe.
Rocky Saugeen.....	64 0	1923	10	Glenelg-Holland.....	Grey.
Saugeen River.....	33 0	1923	6	Egremont-Normanby..	Grey.
Fork's Creek.....	45 0	1923	3	Wainfleet.....	Welland.
Lynn River.....	45 0	1923	3	Townsend.....	Norfolk.
Smith's Creek.....	80 0	1923	12A	Ilope.....	Durham.
Dingman's Creek.....	63 6	1923	4	Westminster.....	Middlesex.
Crown Hill No. 1.....	39 0	1923	11	Oro.....	Simcoe.
Crown Hill No. 2.....	42 0	1923	11	Oro.....	Simcoe.
Arthur Bridge.....	48 5	1923	6	Arthur Village.....	Wellington.
Clappison's Bridge.....	51 0	1923	5	E. and W. Flamboro..	Wentworth.
	(3 spans)				
Brampton No. 1.....	56 0	1923	7	Chinguacousy.....	Peel.
Brampton No. 2.....	56 0	1923	7	Chinguacousy.....	Peel.
Sligo Hill.....	33 6	1923	10	Caledon.....	Peel.
Dublin.....	43 0	1923	8	Hibbert and Logan...	Perth.
Mildmay.....	40 0	1923	9	Carrick.....	Bruce.
Otter Creek No. 1.....	33 0	1923	9	Carrick.....	Bruce.
Otter Creek No. 2.....	56 0	1923	9	Carrick.....	Bruce.
Boston Creek.....	80 0	1923	5	Oneida.....	Haldimand.
Elginfield Bridge.....	48 0	1923	7	London and Biddulph..	Middlesex.
Beckett's Creek.....	25 0	1923	17	Cumberland.....	Russell.
Markdale (concrete).....	33 0	1923	10	Glenelg and Holland..	Grey.
Norval No. 1.....	102 0	1924	7	Esquesing.....	Halton.
Norval No. 2.....	70 0	1924	7	Esquesing.....	Halton.
Norval No. 3.....	45 0	1924	7	Esquesing.....	Halton.
Aux Sable.....	175 0	1924	7	Bosanquet and Williams W.....	Lambton and Middlesex.
Mackenzie Creek.....	80 0	1924	5	Oneida.....	Haldimand.
Cayuga Bridge.....	615 8	1924	3	Cayuga Village.....	Halidmand.
	(5 spans)				
Humber River.....	745 0	1924	5	Etobicoke and York...	York.
	(6 spans)				

APPENDIX No. 20—Continued

Name of Bridge	Span ft. in.	Com- pleted	Road No.	Township	County
Fergus Bridge (concrete).....	115 2	1924	6	Fergus Village.....	Wellington.
Caledor (concrete).....	27 0	1924	10	Caledon.....	Peel.
Nanticoke Creek (concrete).....	40 0	1924	3	Townsend.....	Norfolk.
Snelgrove (concrete).....	33 0	1924	10	Chinguacousy.....	Peel.
Harmony (concrete).....	24 0	1924	2	Whitby E.....	Ontario.
Blessington Cr. (concrete).....	59 9	1924	2	Thurlow.....	Hastings.
New Sarum (concrete).....	80 0	1924	3	Yarmouth.....	Elgin.
	(2 spans)				
St. Mary's (concrete).....	56 6	1924	7	Downie.....	Perth.
Princeton (concrete).....	76 0	1924	2	Burford and Blenheim.	Oxford.
	(2 spans)				
Sandusk (Garnet) (concrete)....	38 0	1924	5	Walpole.....	Haldimand.
Seaforth.....	27 0	1924	8	McKillop and Tucker- smith.....	Huron.
Orangeville.....	28 6	1924	10	Caledon.....	Peel.
Desilicaux (culvert).....	20 0	1924	17	Alfred.....	Russell.
Thamesville (culvert).....	20 0	1924	2	Camden.....	Kent.
Oakwood (culvert).....	40 0	1924	12	Mariposa.....	Victoria.
	(2 spans)				
Orwell (concrete).....	46 0	1925	3	Yarmouth.....	Elgin.
St. John's Bridge (concrete).....	70 0	1925	4	London.....	Middlesex.
Caledonia Road No. 1.....	24 6	1925	5	Glanford.....	Wentworth.
Caledonia Road No. 2.....	31 6	1925	5	Seneca.....	Haldimand.
Ekfrid Township No. 1.....	25 6	1925	2	Ekfrid.....	Middlesex.
Ekfrid Township No. 2 (concrete)	15 4	1925	2	Ekfrid.....	Middlesex.
Ekfrid Township No. 3 (concrete)	37 6	1925	2	Ekfrid.....	Middlesex.
Jeanette Creek (concrete).....	50 0	1925	2	Raleigh.....	Kent.
	(2 spans)				
Tilbury E. and Raleigh Townline Bridge (concrete).....	71 0	1925	2	Tilbury E. and Raleigh	Kent.
	(2 spans)				
Puce River.....	30 6	1925	2	Maidstone.....	Essex.
Medway Creek (concrete).....	40 0	1925	4	London.....	Middlesex.
Aurora Subway.....		1923	11	King and Whitchurch..	York.
Binkley's Subway.....	40 0	1923	2	Ancaster.....	Wentworth.
Bloor Street East Subway.....	70 0	1924	2	Scarborough.....	York.

APPENDIX No. 21

SCHEDULE OF ASSUMPTIONS AND REVERSIONS OF SECTIONS OF THE
PROVINCIAL HIGHWAY SYSTEM FOR THE YEARS 1923-24-25

During the three years the System was extended by assuming 68.4 miles, less 20.3 mile reverted, making a total assumed of 1,861.3 miles as shown on map. A list of the roads added to the System, together with the mileage and date of designation, also list of roads and mileages reverted from the System, is as follows:—

PROVINCIAL HIGHWAYS ASSUMED IN 1923-24-25

County	Date of Designation	Municipality	Mileage	Total Mileage
Bruce.....	11th of March, 1925.....	Carrick.....	.90	.90
Carleton.....	1st of October, 1924.....	Huntley.....	1.50	1.50
Dufferin.....	30th of May, 1923.....	Orangeville Town.....	.86	.86
Grenville.....	25th of November, 1925.....	Kemptville Village.....	.225	
	25th of February, 1925.....	Kemptville Village.....	.671	.896
Grey.....	11th of March, 1925.....	Holland.....	1.463	
	11th of March, 1925.....	Holland.....	.887	2.35
Haldimand.....	18th of April, 1923.....	Dunnville Town.....	.083	
	20th of June, 1923.....	Cayuga Village.....	.20	.283
Halton.....	2nd of May, 1923.....	Nelson.....	1.04	
	11th of March, 1925.....	Esquesing.....	.20	
	14th of April, 1925.....	Oakville Town.....	1.53	
	14th of April, 1925.....	Trafalgar.....	7.87	
	14th of April, 1925.....	Burlington.....	1.55	
	14th of April, 1925.....	Nelson.....	4.60	15.79

County	Date of Designation	Municipality	Mileage	Total Mileage
Hastings.....	17th of June, 1925.....	Tyendinaga.....	.377	.377
Kent.....	11th of March, 1925.....	Raleigh.....	.80	.80
Lanark.....	1st of May, 1923.....	Perth Town.....	.45	
	15th of July, 1924.....	Carleton Place Town.....	.42	.87
Leeds.....	30th of June, 1924.....	Yonge.....	2.591	
	30th of June, 1924.....	Elizabethtown.....	.409	
	17th of June, 1925.....	S. Crosby.....	.012	
	17th of June, 1925.....	S. Crosby.....	.303	3.315
Middlesex.....	11th of July, 1923.....	Ailsa Craig Village.....	.78	.78
Peel.....	14th of April, 1925.....	Port Credit Village.....	1.87	
	14th of April, 1925.....	Toronto.....	7.51	9.38
Prince Edward.....	22nd of October, 1924.....	Ameliasburg.....	.60	
	22nd of October, 1924.....	Ameliasburg.....	.30	.90
Renfrew.....	14th January, 1925.....	Horton.....	5.00	5.00
Stormont.....	23rd of April, 1924.....	Cornwall Town.....	.50	.50
Waterloo.....	24th of June, 1925.....	Waterloo.....	.052	.052
Wellington.....	1st of August, 1923.....	Fergus Village.....	.29	.29
Wentworth.....	2nd of May, 1923.....	Saltfleet.....	7.60	
	1st of August, 1923.....	Saltfleet.....	.44	
	14th of April, 1925.....	Flamboro East.....	5.16	13.20
York.....	13th of February, 1924.....	Gwilliambury East.....	1.66	
	13th of February, 1924.....	King.....	1.27	
	19th of February, 1924.....	Scarboro.....	1.20	
	24th of June, 1925.....	Toronto City.....	.037	
	14th of April, 1925.....	Mimico Town.....	1.43	
	14th of April, 1925.....	New Toronto Town.....	.94	
	14th of April, 1925.....	Etobicoke.....	2.82	9.357
				68.4

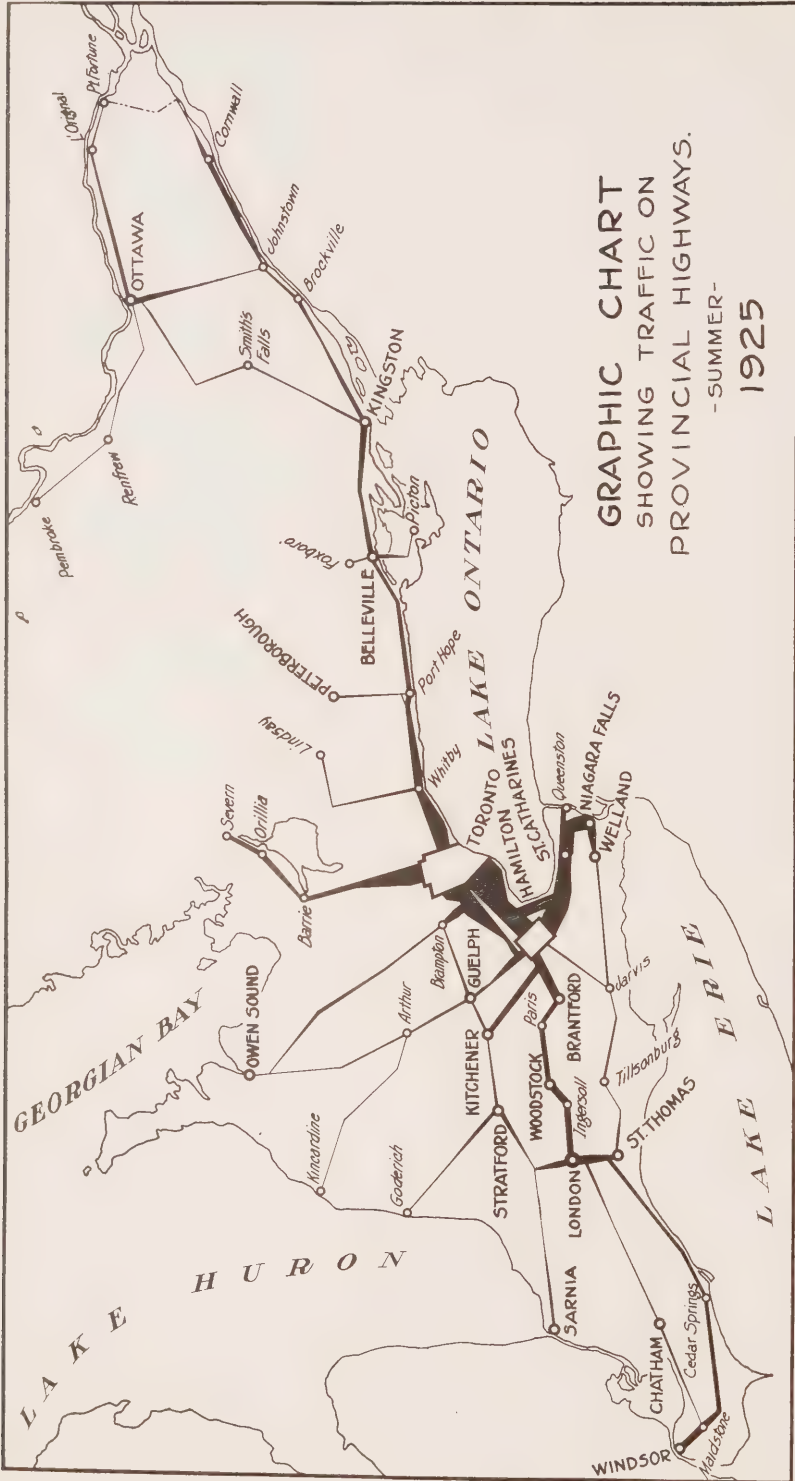
Reversions from January 1st, 1923 to December 31st, 1925

County	Municipality	Year	Mileage	Total Mileage
Bruce.....	Carrick.....	1925.....	1.10	1.10
Carleton.....	Nepean.....	1923.....	.87	
	Huntley.....	1924.....	.81	1.68
Durham.....	Port Hope Town.....	1925.....	.014	
	Cavan.....	1924.....	.015	.029
Grenville.....	Prescott Town.....	1925.....	.25	.25
Grey.....	Holland.....	1925.....	.84	
	Holland.....	1925.....	1.480	2.320
Halton.....	Esquering.....	1925.....	.217	.217
Hastings.....	Tyendinaga.....	1925.....	.55	.55
Kent.....	Raleigh.....	1925.....	.80	.80
Leeds.....	Yonge.....	1924.....	.075	
	Crosby South.....	1925.....	.17	
	Crosby South.....	1925.....	.41	
	Brockville Town.....	1925.....	.27	.925
Lennox and Addington.....	Napanee Town.....	1925.....	.022	.022
Peterborough.....	Monaghan North.....	1924.....	.015	.015
Prince Edward.....	Ameliasburg.....	1924.....	.38	
	Ameliasburg.....	1924.....	.62	1.00
Renfrew.....	Horton.....	1925.....	4.40	4.40
Waterloo.....	Kitchener City.....	1925.....	.34	.34
Welland.....	Stamford.....	1924.....	.08	.08
Wentworth.....	Saltfleet.....	1924.....	.50	
	Hamilton City.....	1924.....	1.10	1.60
York.....	Scarboro.....	1924.....	1.00	
	Scarboro.....	1924.....	.435	
	King.....	1924.....	1.27	
	Gwilliambury East.....	1924.....	2.03	
	Toronto City.....	1925.....	.20	
	Toronto City.....	1925.....	.037	4.972
				20.3

APPENDIX No. 22

PROVINCIAL SUBURBAN ROAD AREAS

City	Direction	Miles	Total
Belleville.....	East.....	2 3/8	
	West.....	2	
	North.....	1 5/8	
	South.....	2 1/2	8 1/2
Brantford.....	Northwest.....	5 1/2	
	East.....	7 3/4	13 1/4
Chatham.....	East.....	5 3/4	
	West.....	6 3/8	12 1/8
Galt.....	North.....	1	
	Southeast.....	5 1/4	6 1/4
Guelph.....	East.....	2 3/4	
	West.....	2 1/2	
	South.....	3 1/2	
	North.....	2 7/8	11 5/8
Hamilton.....	East.....	9	
	South.....	6 1/4	
	Southwest.....	12	
	West.....	4 1/2	
	Hamilton entrance.....	6 3/4	
	Dundas Street.....	3 3/4	
	Toronto-Hamilton Highway.....	5 1/8	
	Burlington Beach Road.....	8 3/4	56 1/8
Kingston.....	East.....	5	
	West.....	5 7/8	
	North.....	4 7/8	15 3/4
Kitchener.....	East.....	3 1/4	
	West.....	3 3/8	
	South.....	6	12 5/8
London.....	East.....	9 1/2	
	South.....	10 1/4	
	North.....	5 1/4	
	West.....	2 1/2	27 1/2
Niagara Falls.....	West.....	4 1/4	
	North.....	3 1/2	7 3/4
	South.....	17 1/2	
Ottawa.....	East.....	7 1/2	
	West—Base Line.....	8 1/4	
	West—Carling Avenue.....	9 3/4	43
	South.....	6 3/4	6 3/4
Owen Sound.....	West.....	5 5/8	5 5/8
Peterborough.....	East.....	5 5/8	5 5/8
Sarnia.....	East.....	3 3/8	
St. Catharines.....	West.....	6	9 3/8
	North.....	4 3/4	
St. Thomas.....	East.....	7 1/4	12
	West.....	3 5/8	
Stratford.....	East.....	2 1/2	
	West.....	2 5/8	8 3/4
	South.....	25 1/2	
Toronto.....	East.....	27 1/4	
	North.....	16 3/4	
	West—Bloor Street.....	9 1/2	
	West—Hurontario Street.....	2 1/2	
	West—Cooksville-Port Credit.....	17 1/8	98 5/8
	Toronto-Hamilton Highway.....	2	
	South.....	4	6
Welland.....	North.....	13 3/4	13 3/4
	East.....	2 1/8	
Windsor.....	East.....	2 7/8	5
Woodstock.....	West.....		



PROVINCIAL HIGHWAY TRAFFIC CENSUS—APPENDIX No. 23
Summary of Provincial Highways' Traffic Census—1914, 1922, 1924, 1925 and 1926

Road No.	Number of Stations					AVERAGE DAILY AVERAGE										AVERAGE DAILY MAXIMUM									
	1914	1922	1924	1925	1926	Sum. 1914	Sum. 1922	Sum. 1924	Aut. 1924	Sum. 1925	Aut. 1925	Sum. 1926	Aut. 1926	Sum. 1914	Sum. 1922	Sum. 1924	Aut. 1924	Sum. 1925	Aut. 1925	Sum. 1926	Aut. 1926				
2	14	23	33	36	35	247	1,032	1,821	1,008	1,854	979	2,542	.....	347	1,461	2,604	1,414	2,614	1,290	3,710	.....			
3	2	11	16	16	16	195	518	863	537	925	490	1,214	.....	294	809	1,405	909	1,429	721	1,656	.....			
4	3	3	4	4	4	187	552	1,599	887	1,428	588	1,803	.....	196	815	2,305	1,145	2,271	739	2,437	.....			
5	3	3	6	6	8	494	1,184	2,383	1,694	3,071	1,728	2,840	.....	707	2,204	3,479	2,703	4,607	2,575	4,483	.....			
6	2	5	6	7	7	142	471	1,069	686	788	611	1,329	.....	236	609	1,649	787	1,280	804	2,175	.....			
7	3	9	14	14	14	145	389	621	396	677	440	983	.....	208	550	920	601	1,124	649	1,593	.....			
8	4	5	10	10	11	234	2,006	2,620	1,318	2,876	1,219	3,388	.....	371	3,369	4,131	2,258	4,391	1,790	5,479	.....			
8A									754	2,675	963	5,316	.....	.....	.....	.....	1,214	3,856	1,654	9,222	.....			
9								217	167	257	152	429	.....	.....	.....	306	219	378	159	672	.....			
10	1	4	4	4	4	64	427	650	475	537	326	708	.....	76	564	851	586	744	410	1,020	.....			
11	1	5	6	7	7	337	649	1,617	815	2,076	946	3,112	.....	500	1,113	2,676	1,269	3,148	1,160	4,943	.....			
12		3	4	4	3		357	713	359	605	292	816	.....		508	1,151	509	1,065	365	1,768	.....			
12A	1	2	2	2	2	60	418	644	392	570	267	741	.....	109	579	1,142	590	910	356	1,134	.....			
14		2	3	3	3		179	609	376	637	330	548	.....		628	927	544	961	431	864	.....			
15		1	5	5	6		517	503	348	578	305	465	.....		673	729	691	933	455	819	.....			
16	1	3	3	3	3	94	524	680	460	838	344	1,029	.....	101	836	960	726	1,087	492	1,551	.....			
17	1	5	7	7	7	198	362	345	289	452	223	539	.....	344	849	557	551	634	304	799	.....			
17 total	38	85	130	135	137	2,397	9,585	16,960	10,961	20,844	10,203	27,902	.....	3,489	15,717	25,792	16,716	31,432	14,354	44,345	.....			
1 rd. at 1 st.						200	639	1,060	645	1,226	600	1,641	.....	291	1,048	1,612	983	1,849	844	2,609	.....			
Per cent. increase over previous summer.						.....	220%	65%	.....	16%	.....	34%	.....	.....	260%	54%	.....	14%	.....	41%	.....			

AVERAGE DAILY AVERAGE, 1914

Traffic Census

DAILY AVERAGE

Road No.	Location of Observer	Number of Stations	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
2	Windsor-Quebec boundary.....	14	86	....	....	2	159	247	347
3	Windsor-Niagara Falls.....	2	75	....	2	....	118	195	294
4	St. Thomas to Northern Highway.....	3	63	....	3	....	121	187	196
5	Toronto-Jarvis.....	3	234	....	9	....	251	494	707
6	Hamilton-Owen Sound.....	2	35	....	1	....	106	142	236
7	Port Credit-Sarnia.....	5	37	....	1	....	107	145	208
8	Niagara Falls-Coderich.....	4	95	....	1	....	138	234	371
10	Brampton-Owen Sound.....	1	13	....	....	....	51	64	76
11	Toronto-Severn.....	1	239	....	10	....	88	337	500
12A	Port Hope-Peterborough.....	1	18	....	....	....	42	60	109
16	Ottawa-Prescott.....	1	11	....	....	....	83	94	101
17	Point Fortune-Pembroke.....	1	39	....	....	....	159	198	344
Total number of stations.....38									
Total—	Average Daily Average for 12 roads at 1 station.....	945	....	....	27	2	1,423	2,397	3,489
	Average Daily Average for 1 road at 1 station.....	79	....	....	2	....	119	200	291
	Percentage on whole.....	39.45	....	....	1.13	....	59.42	100.00	....

This traffic census was taken for seven consecutive days, the periods differing on the various roads from July 28th to September 6th.
The weather was mostly fine.

AVERAGE DAILY AVERAGE—1922

Traffic Census

DAILY AVERAGE

Road No.	Location of Observer	Number of Stations	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
2	Windsor-Quebec Boundary.....	23	866	....	70	11	85	1,032	1,461
3	Windsor-Niagara Falls.....	11	438	....	31	2	47	518	809
4	St. Thomas to Northern Highway.....	4	456	....	30	1	65	552	815
5	Toronto-Jarvis.....	3	984	....	106	19	75	1,184	2,264
6	Hamilton-Owen Sound.....	5	388	1	23	6	53	471	699
7	Port Credit-Sarnia.....	9	323	2	18	....	46	389	550
8	Niagara Falls-Goderich.....	5	1,762	....	122	11	111	2,006	3,369
10	Brampton-Owen Sound.....	4	313	....	36	....	78	427	564
11	Toronto-Severn.....	5	584	....	34	1	30	649	1,113
12	Whitby-Lindsay.....	3	285	....	20	....	52	357	508
12A	Port Hope-Peterborough.....	2	340	....	18	....	60	418	579
14	Picton-Foxboro.....	2	143	....	10	....	26	179	628
15	Ottawa-Kingston.....	1	347	....	18	....	152	517	673
16	Ottawa-Prescott.....	3	418	....	24	6	76	524	836
17	Point Fortune-Pembroke.....	5	261	....	25	6	70	362	849
Total number of stations.....85									
Total—	Average Daily Average for 15 roads at 1 station.....		7,908	3	585	63	1,026	9,585	15,717
	Average Daily Average for 1 road at 1 station.....		527	....	39	4	69	639	1,048
	Percentage on whole.....		82.6	....	6.1	.6	10.7	100.00	....

This traffic census was taken for seven consecutive days from August 30th to September 5th. The weather was fine throughout the week.

AVERAGE DAILY AVERAGE—SUMMER, 1924

Traffic Census

DAILY AVERAGE

Road No.	Location of Observer	Number of Stations	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
2	Windsor-Quebec Boundary.....	33	1,426	201	118	18	58	1,821	2,604
3	Windsor-Niagara Falls.....	16	630	128	60	4	41	863	1,405
4	St. Thomas to Northern Highway.....	4	1,351	115	79	4	50	1,599	2,305
5	Toronto-Jarvis.....	6	2,149	39	152	14	29	2,383	3,479
6	Hamilton-Owen Sound.....	7	908	32	62	4	63	1,069	1,649
7	Port Credit-Sarnia.....	14	470	76	30	1	44	621	920
8	Niagara Falls-Goderich.....	10	1,932	491	143	14	40	2,630	4,131
9	Arthur-Kincardine.....	4	161	5	8	.....	43	217	306
10	Brampton-Owen Sound.....	4	544	6	37	2	67	656	851
11	Toronto-Severn.....	6	1,446	66	71	6	28	1,617	2,676
12	Whitby-Lindsay.....	4	644	14	26	.....	29	713	1,151
12A	Port Hope-Peterborough.....	2	546	33	27	.....	38	644	1,142
14	Picton-Foxboro.....	3	485	6	35	1	82	609	927
15	Ottawa-Kingston.....	5	394	15	33	.....	61	503	729
16	Ottawa-Prescott.....	3	550	56	32	.....	39	680	960
17	Point Fortune-Pembroke.....	7	247	13	18	4	63	345	557
Total—	Total number of stations.....	128							
	Average Daily Average on 17 roads at 1 station.....		13,883	1,296	931	75	775	16,960	25,792
	Average Daily Average on 1 road at 1 station.....		868	81	58	5	48	1,060	1,612
	Percentage on whole.....		81.85	7.65	5.49	.44	4.57	100.00	.....

This traffic census was taken for seven consecutive days from July 28th to August 3rd.
 The weather during this week was fine for five days and scattered showers on the other two days.

AVERAGE DAILY AVERAGE—AUTUMN, 1924

Traffic Census

DAILY AVERAGE

Road No.	Location of Observer	Number of Stations	Automobiles		Trucks	Busses	Horse-drawn Average	Total Daily Vehicles	Maximum for One Day
			Ontario	Foreign					
2	Windsor to Quebec Boundary.....	32	766	39	124	14	65	1,008	1,414
3	Windsor to Niagara Falls.....	16	393	47	50	4	43	537	909
4	St. Thomas to Northern Highway.....	4	749	13	64	2	59	887	1,145
5	Toronto to Jarvis.....	6	1,448	18	168	13	47	1,694	2,703
6	Hamilton to Owen Sound.....	7	548	8	64	4	62	787	1,001
7	Port Credit to Sarnia.....	14	306	15	34	1	40	396	601
8	Niagara Falls to Goderich.....	10	922	175	163	12	46	1,318	2,258
8A	Burlington Beach Highway.....	2	595	36	103	.....	20	754	1,214
9	Arthur to Kincardine.....	4	109	2	8	.....	48	167	219
10	Brampton to Owen Sound.....	4	374	1	33	.....	65	475	586
11	Toronto to Severn.....	6	672	10	95	5	33	815	1,269
12	Whitby to Lindsay.....	4	301	1	22	.....	35	359	509
12A	Port Hope to Peterborough.....	2	306	4	35	.....	47	392	590
14	Picton to Foxboro.....	3	272	1	36	2	65	376	544
15	Ottawa to Kingston.....	5	262	6	20	.....	60	348	691
16	Ottawa to Prescott.....	3	368	23	30	.....	39	460	726
17	Point Fortune to Pembroke.....	7	171	39	16	4	59	289	551
Total—	Total number of stations.....	129							
	Average Daily Average on 17 roads, 1 station.....		8,562	438	1,065	63	833	10,961	16,716
	Average Daily Average on 1 road, 1 station.....		503	26	63	4	49	645	983
	Percentage on whole.....		77.98	4.03	9.77	.62	7.60	100.00	.....

This traffic census was taken for seven consecutive days from October 28th to November 3rd.
The weather was fine throughout this week.

AVERAGE DAILY AVERAGE—SUMMER, 1925

Traffic Census

DAILY AVERAGE

Road No.	Location of Observer	Number of Stations	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
2	Windsor to Quebec Boundary.....	36	1,236	410	148	17	43	1,854	2,614
3	Windsor to Niagara Falls.....	16	558	277	61	2	27	925	1,429
4	St. Thomas to Northern Highway.....	4	1,004	307	89	4	24	1,428	2,271
5	Toronto to Jarvis.....	7	2,532	201	298	16	24	3,071	4,607
6	Hamilton to Owen Sound.....	7	624	54	59	5	46	788	1,280
7	Port Credit to Sarnia.....	14	504	100	45	1	27	677	1,124
8	Niagara Falls to Goderich.....	10	1,537	1,092	191	21	35	2,876	4,391
8A	Burlington Beach Highway.....	2	2,096	344	185	2	48	2,675	3,856
9	Arthur to Kincardine.....	4	191	9	12	.....	45	257	378
10	Brampton to Owen Sound.....	4	449	15	29	3	41	537	744
11	Toronto to Severn.....	7	1,691	210	150	2	23	2,076	3,148
12	Whitby to Lindsay.....	4	513	31	31	.....	30	605	1,065
12A	Port Hope to Peterborough.....	1	467	51	33	.....	19	570	910
14	Picton to Foxboro.....	3	527	28	40	1	41	637	961
15	Ottawa to Kingston.....	5	409	78	30	3	58	579	933
16	Ottawa to Prescott.....	3	618	134	43	10	33	838	1,087
17	Point Fortune to Pembroke.....	7	256	99	22	8	67	452	634
Total—Average Daily Average on 17 roads, 1 station.....		134	15,212	3,440	1,466	95	631	20,844	31,432
Average Daily Average on 1 road, 1 station.....			895	202	86	6	37	1,226	1,849
Percentage on whole.....			73.	16.48	7.02	.49	3.01	100.00	.....

This traffic census was taken for seven consecutive days from August 5th to August 11th.

The weather throughout this week was five days fine and two days showery.

AVERAGE DAILY AVERAGE—AUTUMN, 1925

Traffic Census

DAILY AVERAGE

Road No.	Location of Observer	Number of Stations	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
2	Windsor to Quebec Boundary.....	36	723	52	137	22	45	979	1,290
3	Windsor to Niagara Falls.....	15	368	23	56	6	37	490	721
4	St. Thomas to Northern Highway.....	4	498	11	52	3	24	588	739
5	Toronto to Jarvis.....	6	1,439	28	223	13	25	1,728	2,575
6	Hamilton to Owen Sound.....	7	483	7	66	5	50	611	804
7	Port Credit to Sumia.....	14	349	13	42	2	34	440	649
8	Niagara Falls to Goderich.....	9	810	193	167	19	30	1,219	1,790
8a	Burlington Beach Highway.....	2	739	48	140	.....	36	963	1,654
9	Arthur to Kincardine.....	4	89	1	6	.....	56	152	159
10	Brampton to Owen Sound.....	4	243	.....	29	.....	52	326	410
11	Toronto to Severn.....	7	770	6	139	4	27	946	1,160
12	Whitby to Lindsay.....	4	234	1	27	.....	30	292	365
12a	Port Hope to Peterborough.....	2	204	2	25	.....	36	267	356
14	Pictou to Foxboro.....	3	258	2	24	3	43	330	431
15	Ottawa to Kingston.....	5	225	5	23	3	49	305	455
16	Ottawa to Prescott.....	3	239	35	228	6	36	344	492
17	Point Fortune to Pembroke.....	7	126	21	21	5	50	223	304
Total—Average Daily Average on 17 roads, 1 station.....		132	7,797	448	1,205	93	660	10,203	14,354
Average Daily Average on 1 road, 1 station.....			459	26	71	5	39	600	844
Percentage on whole.....			76.5	4.4	11.8	.8	6.5	100.00	.....

This traffic census was taken for seven consecutive days from October 24th to 30th. During this week there were five days of rain or snow and two days fine.

AVERAGE DAILY AVERAGE—SUMMER, 1926

Traffic Census

DAILY AVERAGE

Road No.	Location of Observer	Number of Stations	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
2	Windsor to Quebec Boundary.....	35	1,822	486	176	23	35	2,542	3,710
3	Windsor to Niagara Falls.....	16	784	278	109	7	36	1,214	1,656
4	St. Thomas to Northern Highway.....	4	1,433	255	87	6	22	1,803	2,457
5	Toronto to Jarvis.....	8	2,458	142	199	20	21	2,840	4,483
6	Hamilton to Owen Sound.....	7	1,114	77	83	9	46	1,329	2,175
7	Port Credit to Sarnia.....	14	759	132	57	8	27	983	1,593
8	Niagara Falls to Goderich.....	11	1,997	1,138	193	29	31	3,388	5,479
8A	Burlington Beach Highway.....	2	4,287	694	297	7	31	5,316	9,222
9	Arthur to Kincardine.....	4	351	15	17	.....	46	429	672
10	Brampton to Owen Sound.....	4	617	10	42	4	35	708	1,020
11	Toronto to Severn.....	7	2,725	218	140	10	19	3,112	4,943
12	Whitby to Lindsay.....	3	725	29	30	4	28	816	1,768
12A	Port Hope to Foxboro.....	2	585	76	43	3	34	741	1,134
14	Picton to Peterborough.....	3	432	24	41	1	50	548	864
15	Ottawa to Kingston.....	6	439	49	30	.....	45	565	819
16	Ottawa to Prescott.....	3	763	169	58	9	30	1,029	1,551
17	Point Fortune to Pembroke.....	7	334	109	34	8	54	539	799
Total number of stations.....		136							
Total—Average Daily Average on 17 roads at 1 station.....			21,625	3,901	1,636	150	590	27,902	44,345
Average Daily Average on 1 road at 1 station.....			1,272	229	96	9	35	1,641	2,609
Percentage of whole.....			77.51	13.96	5.85	.55	2.13	100	.....

This traffic census was taken for seven consecutive days from July 29th to August 4th.
Five days fine and warm, two days rain.

WINDSOR-QUEBEC BOUNDARY HIGHWAY

Road No. 2

Traffic Census

DAILY AVERAGE

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
1	South of Windsor at Howard Avenue.....	S. 1914	99	.....	3	.....	112	214	313
		S. 1922	1,081	.....	51	4	50	1,186	1,966
		S. 1924	1,989	377	176	19	17	2,578	4,773
		A. 1924	952	208	162	18	21	1,361	2,725
		S. 1925	972	640	102	4	9	1,727	3,654
2	Maidstone.....	A. 1925	1,160	50	192	37	60	1,499	1,515
		S. 1926	1,795	173	529	24	131	2,652	3,425
		S. 1922	330	.....	14	.....	27	371	802
		S. 1924	200	75	17	.....	20	312	548
		A. 1924	46	2	9	.....	17	74	148
3	Woodslee.....	S. 1925	151	18	18	.....	13	200	410
		A. 1925	127	11	23	.....	12	173	322
		S. 1926	186	41	30	.....	22	279	382
		S. 1924	327	87	21	.....	61	496	808
		A. 1924	234	18	16	.....	31	299	528
4	West of Chatham, Townline Road between Tilbury East and Tilbury North.....	S. 1925	199	16	122	.....	27	364	423
		A. 1925	Under construction	.....	.....	.....	.....	.....	.....
		S. 1926	271	38	42	.....	31	382	430
		1922	156	.....	11	5	7	179	286
		S. 1924	394	112	29	1	41	577	895
5	East of Chatham at Tupperville Road.....	A. 1924	482	58	50	9	114	713	1,066
		S. 1925	482	187	43	10	21	743	1,360
		A. 1925	383	108	54	9	50	640	938
		S. 1926	712	389	57	13	11	1,182	1,748
		1914	16	.....	.....	.....	54	70	108
		1922	209	.....	18	.....	23	250	424
		S. 1924	653	107	42	3	10	815	1,108
		A. 1924	528	26	41	2	29	626	971
		S. 1925	486	58	64	4	13	625	911
		A. 1925	418	38	41	3	19	519	677
		S. 1926	715	237	75	7	7	1,041	1,430

12	Concessions 1 and 2, Brantford Township.....	1914 1922	53 411	..... .....	2 51	..... .....	39 80	94 543	124 687
	S. 1924	1924	944	253	68	.....	10	1,275	1,890
	A. 1924	1924	580	16	56	.....	17	669	929
	S. 1925	1925	924	459	81	.....	10	1,475	2,175
	A. 1925	1925	605	99	92	.....	17	813	1,251
	S. 1926	1926	1,717	863	135	.....	12	2,730	4,089
13	Cainsville.....	1914 1922	131 1,425	..... .....	..... .....	..... .....	257 86	389 1,608	578 2,154
	S. 1924	1924	1,892	435	90	.....	112	2,564	3,910
	A. 1924	1924	1,059	74	123	.....	120	1,408	2,096
	S. 1925	1925	1,608	814	164	.....	71	2,689	4,272
	A. 1925	1925	1,078	164	164	.....	104	1,514	2,004
	S. 1926	1926	2,785	1,236	228	.....	64	4,327	6,158
14	Binkley's Corners.....	1914 1922	153 2,668	..... .....	10 264	..... .....	321 120	484 3,130	666 4,005
	S. 1924	1924	4,856	275	405	.....	97	5,761	7,343
	A. 1924	1924	1,279	84	170	.....	42	1,575	2,377
	S. 1925	1925	1,817	789	223	.....	38	2,867	3,973
	A. 1925	1925	1,301	87	244	.....	40	1,672	2,004
	S. 1926	1926	2,543	931	251	.....	29	3,762	5,273
	S. 1924	1924	4,372	602	319	.....	6	5,323	8,411
15	Burlington.....	1924 1925	2,044 3,202	42 1,111	448 506	..... .....	14 15	2,592 4,899	3,367 6,818
	A. 1925	1925	1,726	129	459	.....	10	2,377	3,177
	S. 1926	1926	4,376	1,133	541	.....	5	6,140	8,691
	S. 1924	1924	4,364	614	414	.....	19	5,439	8,871
	A. 1924	1924	2,302	47	546	.....	35	2,976	3,627
	S. 1925	1925	2,880	996	482	.....	20	4,448	5,598
	A. 1925	1925	1,867	149	522	.....	22	2,614	3,333
	S. 1926	1926	4,058	1,009	509	.....	13	5,676	8,658
17	Long Branch.....	1924 1925	6,325 3,832	563 78	686 793	..... .....	85 102	7,858 4,944	10,445 6,534
	A. 1924	1924	6,958	985	926	.....	57	9,133	10,089
	S. 1925	1925	2,943	72	657	.....	84	4,067	5,090
	S. 1926	1926	6,349	1,559	780	.....	57	9,016	13,352
18	Corner Danforth Avenue and Markham Road.	1922 1924	4,126 2,268	..... .....	429 446	..... .....	133 108	4,779 2,920	7,310 3,645
	A. 1924	1924	1,496	5	406	.....	188	2,175	2,605
	S. 1925	1925	3,313	174	533	.....	132	4,233	7,872
	A. 1925	1925	1,923	25	537	.....	197	2,782	3,679
	S. 1926	1926	6,494	270	498	.....	79	7,392	12,115
18½	½ Junction, Old Kingston Road and Provincial High way.....	1925 1925	3,551 2,096	867 35	485 371	..... .....	63 23	4,987 2,544	7,814 3,939
	S. 1926	1926	6,765	630	642	.....	39	8,135	12,050

25	West of Belleville, Lot 31, Con. 1, Sidney Township.	1914 1922	67 793	1 73	..... 9	155 173	223 1,048	278 1,380
		S. 1924	932	57	10	56	1,175	1,519
		A. 1924	363	122	13	160	673	776
		S. 1925	638	15	.....	30	936	1,336
		A. 1925	516	8	67	104	751	773
		S. 1926	1,241	260	66	29	1,613	2,040
26	East of Belleville at Point Anne Road.....	1914 1922	28 545	..... 34	..... 5	107 57	135 641	191 858
		S. 1924	809	84	4	29	956	1,225
		A. 1924	678	19	4	36	794	1,140
		S. 1925	1,025	301	5	24	1,401	1,760
		A. 1925	497	17	6	29	580	775
		S. 1926	1,077	319	11	29	1,496	1,910
27	Marysville.....	1914 1922	486 288	21 20	1	63 46	690 362	850 430
		A. 1924	288	8	.....	47	844	1,033
		S. 1925	467	301	.....	49	374	442
		A. 1925	281	15	2	35	1,048	1,243
		S. 1926	644	332	5	411	476	695
28	Catawaqui Corner.....	1914 1922	63 770	2 65	..... 9	160 82	1,004 1,341	1,341 1,854
		S. 1924	1,110	78	7	88	1,454	1,854
		A. 1924	764	63	6	38	902	1,372
		S. 1925	1,218	65	6	48	1,658	1,958
		A. 1925	651	41	7	53	761	1,219
		S. 1926	1,515	93	13	55	2,013	3,220
29	Barrie.....	1914 1922	956 437	53 39	7 5	36 37	1,584 550	1,584 864
		A. 1924	761	62	10	33	1,229	1,458
		S. 1925	342	39	7	32	443	648
		A. 1925	984	71	7	36	1,460	1,749
		S. 1926	261	22	5	30	551	697
29 1/2	Mallory town.....	1914 1922	102 354	11 22	5 5	12 38	156 653	235 782
		A. 1924	102	11	.....	277	414	539
		S. 1926	354	22	.....	158	821	.....
30	West of Brockville at Lynn Road.....	1914 1922	137 608	..... 55	..... 6	86 70	1,216 658	1,732 957
		S. 1924	978	41	2	29	1,068	1,412
		A. 1924	496	44	11	24	243	345
		S. 1925	706	41	3	33	1,290	1,779
		A. 1925	182	7	.....	.....	.....	.....
		S. 1926	866	54	5	.....	.....	.....

WINDSOR-QUEBEC BOUNDARY HIGHWAY

(Road No. 2—Con.)

Traffic Census

DAILY AVERAGE

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
31	East of Brockville, Lot 1, Con. 1, Elizabethtown Township.....	1914	38	.....	.....	.....	58	96	114
		1922	514	.....	43	.....	68	632	.....
		S. 1924	782	118	53	7	61	1,021	1,341
		A. 1924	528	18	48	6	57	657	952
		S. 1925	534	230	71	11	54	880	1,110
32	Johnstown Corners.....	A. 1925	289	25	43	10	32	399	670
		S. 1926	844	301	79	12	30	1,266	1,773
		1922	214	.....	5	7	43	269	403
		S. 1924	741	119	31	5	31	927	1,483
		A. 1924	333	43	25	3	25	429	675
33	Intersection of Morrisburg-Ottawa Highway and River Road at Morrisburg.....	S. 1925	353	222	23	6	17	621	824
		A. 1925	107	43	13	3	18	184	223
		S. 1926	457	244	32	4	13	750	1,116
		S. 1924	579	61	60	10	121	831	1,002
		A. 1924	449	39	45	14	90	637	933
34	West limits of Cornwall.....	S. 1925	866	280	111	12	208	1,477	1,925
		A. 1925	256	32	42	7	84	421	519
		S. 1926	361	250	47	4	38	700	801
		S. 1922	573	.....	69	1	199	842	943
		S. 1924	709	84	77	4	141	1,015	1,194
35	Bainsville side-road.....	A. 1924	527	30	75	3	163	798	1,100
		S. 1925	796	262	140	5	164	1,367	1,516
		A. 1925	569	38	87	4	119	817	1,191
		S. 1926	1,086	429	122	5	118	1,760	2,574
		1922	70	.....	1	.....	40	112	136
		S. 1924	160	52	68	.....	132	412	496
		A. 1924	71	41	69	.....	180	361	531
		S. 1925	51	244	26	.....	25	446	636
		A. 1925	80	33	14	.....	23	151	217
		S. 1926	206	309	17	1	25	558	921

Traffic Census
DAILY AVERAGE

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
1	South of Windsor at Howard Avenue.....	1914	99	.....	3	.....	112	214	313
		1922	1,081	.....	51	4	50	1,186	1,966
		S. 1924	1,989	377	176	19	17	2,578	4,773
		A. 1924	952	208	162	18	21	1,361	2,725
		S. 1925	972	640	102	4	9	1,727	2,654
		A. 1925	1,160	50	192	37	60	1,499	1,515
2	Maidstone.....	S. 1926	1,795	173	529	24	131	2,652	3,425
		1922	330	.....	14	.....	25	369	802
		S. 1924	1,207	438	142	16	30	1,833	3,481
		A. 1924	747	223	120	13	41	1,124	2,577
		S. 1925	1,009	745	181	11	22	1,968	2,637
		A. 1925	766	99	125	11	20	1,021	1,630
3	North of Cottam.....	S. 1926	1,574	861	237	14	30	2,716	3,881
		1922	668	.....	50	.....	26	744	1,420
		S. 1924	844	417	129	12	54	1,456	2,614
		A. 1924	428	75	55	5	18	581	1,425
		S. 1925	587	501	102	1	17	1,208	2,448
		A. 1925	240	19	45	10	17	331	445
4	Cedar Springs.....	S. 1926	1,150	680	127	14	16	1,987	2,898
		1922	668	.....	46	7	30	748	1,178
		S. 1924	748	88	117	.....	23	976	1,483
		A. 1924	347	22	50	.....	40	459	645
		S. 1925	572	330	59	2	14	977	1,825
		A. 1925	259	13	44	4	24	344	401
5	Morpeh.....	S. 1926	959	463	89	3	33	1,548	2,023
		1922	337	.....	25	.....	64	426	514
		S. 1924	433	100	27	.....	21	581	930
		A. 1924	282	18	22	.....	30	460	645
		S. 1925	552	420	43	.....	23	1,038	1,534
		A. 1925	255	10	30	1	26	322	567
6	Wallacetown.....	S. 1926	722	423	57	8	50	1,200	1,616
		1922	139	.....	26	.....	79	244	277
		S. 1924	377	80	18	.....	41	516	770
		A. 1924	300	14	20	.....	75	409	495
		S. 1925	428	416	17	.....	11	872	1,262
		A. 1925	145	13	14	.....	23	195	274
7		S. 1926	526	335	26	1	11	898	1,208

WINDSOR-NIAGARA FALLS HIGHWAY—Via St. Thomas and Welland

Road No. 3—(Con.)

Traffic Census

DAILY AVERAGE

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
6	Talbotville.....	1922	224	.....	14	.....	89	327	402
		S. 1924	432	65	26	.....	27	550	870
		A. 1924	336	16	27	.....	53	432	594
		S. 1925	533	376	42	.....	33	984	1,360
7	New Sarum.....	A. 1925	Under construction.	.....	.....	.....	.....	.....	.....
		S. 1926	659	250	36	1	10	955	1,316
		S. 1914	51	.....	.....	.....	125	176	274
		1922	545	.....	41	.....	45	631	920
		1924	836	55	36	.....	43	971	1,675
		A. 1924	559	12	39	1	32	642	953
		S. 1925	726	97	40	.....	19	882	1,454
		A. 1925	418	4	40	.....	20	482	726
		S. 1926	865	108	52	9	21	1,055	1,239
		S. 1924	245	32	15	.....	23	315	586
8	Bayham Road.....	A. 1924	100	6	6	.....	12	124	195
		S. 1925	139	69	8	.....	9	225	324
		A. 1925	56	3	6	.....	8	73	105
		S. 1926	223	98	15	5	10	351	442
		S. 1924	397	37	42	.....	113	589	707
9	Courtland.....	A. 1924	281	8	36	.....	81	406	491
		S. 1925	336	80	44	.....	65	525	695
		A. 1925	249	5	34	.....	102	390	491
		S. 1926	477	96	61	.....	77	719	851
		S. 1924	325	24	15	.....	88	452	532
10	Renton.....	A. 1924	293	6	23	.....	42	364	624
		S. 1925	253	62	21	.....	30	366	427
		A. 1925	191	4	15	.....	43	253	318
		S. 1926	342	110	144	.....	30	635	739
		S. 1922	195	.....	21	7	34	257	334
11	Jarvis.....	S. 1924	445	34	48	.....	56	583	660
		A. 1924	490	5	63	3	98	659	846
		S. 1925	346	57	37	.....	41	481	555
		A. 1925	386	2	63	5	83	539	684
		S. 1926	652	94	63	8	67	884	1,106

12	Nelles Corners.....	S. 1924	261	43	28	5	22	359	497
		A. 1924	187	13	27	6	36	269	336
		S. 1925	321	94	39	4	27	485	604
		A. 1925	227	10	33	6	26	302	374
		S. 1926	390	120	55	1	13	580	738
13	Canboro Corners.....	S. 1922	301	.....	18	4	30	353	489
		S. 1924	301	50	26	.....	20	397	717
		A. 1924	199	32	34	.....	24	289	478
		S. 1925	350	94	37	.....	25	513	744
		A. 1925	182	16	34	7	30	269	379
		S. 1926	439	119	42	6	20	626	982
14	Forks Road, Lots 39, 40.....	S. 1922	329	.....	33	5	41	408	592
		S. 1924	253	61	30	4	18	366	731
		A. 1924	246	39	42	4	23	354	732
		S. 1925	351	137	49	3	19	559	996
		A. 1925	264	32	41	4	23	364	464
		S. 1926	683	200	59	5	18	965	1,758
		S. 1924	593	150	85	5	49	882	1,446
		A. 1924	451	59	76	5	57	648	968
		S. 1925	1,445	307	162	8	62	1,984	3,350
		A. 1925	723	64	120	6	54	967	1,072
15	West of Niagara Falls at Montrose Road.....	S. 1926	1,069	319	156	5	57	1,606	2,271

ST. THOMAS-NORTHERN HIGHWAY—Via London

Traffic Census

DAILY AVERAGE

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
1	Talbotville.....	1914	55	.....	4	.....	96	155	292
		1922	331	.....	12	.....	88	431	674
		S. 1924	1,451	135	96	.....	40	1,723	2,609
		A. 1924	875	32	75	.....	65	1,047	1,308
		S. 1925	928	144	65	.....	15	1,152	1,830
		A. 1925	505	5	56	.....	31	597	684
		S. 1926	1,902	420	97	1	24	2,444	3,183
2	Lambeth.....	1914	84	.....	4	.....	163	251	305
		1922	391	.....	27	.....	57	476	672
		S. 1924	2,501	87	119	9	75	2,791	3,898
		A. 1924	1,545	14	123	6	79	1,767	2,178
		S. 1925	1,625	579	171	6	33	2,415	3,748
		A. 1926	764	27	87	3	21	902	1,199
		S. 1926	2,129	433	131	4	19	2,716	3,717
3	North of London, Concessions 4 and 5, London Township.....	1914	51	.....	2	.....	104	157	181
		1922	786	.....	66	2	87	941	1,324
		S. 1924	1,052	224	72	5	62	1,415	2,087
		A. 1924	339	4	40	2	63	448	688
		S. 1925	1,221	482	107	6	38	1,854	3,022
		A. 1925	581	12	57	5	29	684	867
		S. 1926	1,059	109	57	9	34	1,299	1,809
4	Elginfield.....	1922	316	.....	16	1	26	359	588
		S. 1924	399	13	29	2	24	467	624
		A. 1924	236	.....	18	2	28	284	407
		S. 1925	243	25	12	3	9	292	483
		A. 1925	142	2	8	3	14	169	207
		S. 1926	640	57	35	11	11	754	1,119

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
0	City limits, Bloor Street West.....	S. 1925 A. 1925	5,519 Not taken.	422	798	42	55	6,836	9,492
1	Bloor and Dundas Street intersection.....	1914 1922	348 1,576	.....	14 85	..... 30	250 60	612 1,751	910 4,106
		1924	4,187	6	304	32	41	4,570	6,468
		A. 1924	2,696	24	373	23	45	3,161	5,242
		S. 1925	3,592	196	412	25	15	4,240	6,253
		A. 1925	2,067	381	42	15	13	2,518	3,653
		S. 1926	5,558	189	461	33	12	6,253	9,523
2	Cooksville.....	1914 1922	312 851	.....	13 143	.....	264 69	590 1,063	710 1,785
		S. 1924	4,101	70	365	19	55	4,610	7,001
		A. 1924	2,651	24	334	19	68	3,096	4,948
		S. 1925	4,062	247	520	25	39	4,893	7,914
		A. 1925	3,232	39	621	32	36	3,960	6,506
		S. 1926	5,791	270	554	47	36	6,698	10,856
3	Franklin.....	S. 1924 A. 1924	2,064 1,238	62 97	60 143	..... 5	11 19	2,197 1,379	3,026 2,294
		S. 1925	1,705	25	192	.....	12	2,057	3,411
		A. 1925	1,091	27	106	6	8	1,238	1,738
		S. 1926	2,353	219	141	12	11	2,736	4,538
4	Junction of Dundas and Brant Streets.....	S. 1925 A. 1925	1,095 848	158 33	59 74	7 6	4 8	1,323 969	2,184 1,343
5	Clappison's Corners.....	S. 1926 S. 1924	1,900 1,680	198 72	101 92	10	6 13	2,215 1,857	3,598 2,924
		A. 1924	1,182	24	86	.....	12	1,304	2,060
		S. 1925	1,371	163	116	.....	11	1,668	2,631
		A. 1925	1,043	25	115	6	13	1,202	1,609
		S. 1926	2,085	174	123	11	6	2,399	3,893
6	Concessions 5 and 6, Glanford Township.....	S. 1924 A. 1924	542 485	10 7	63 75	34 31	18 44	667 642	976 820
		S. 1925	Closed to traffic.	.....	.....	.....	.....	.....	.....
		A. 1925	Closed to traffic.	.....	.....	.....	.....	.....	.....
6½	At Ohsweken Road.....	S. 1926	967	45	113	20	28	1,173	1,756
7	Jarvis.....	S. 1926	506	20	59	14	25	624	869
		1914	41	.....	1	.....	240	282	492
		1922	525	.....	90	26	97	738	900
		A. 1924	321	11	25	.....	35	392	481
		S. 1925	439	6	45	6	91	583	855
		A. 1925	377	26	38	5	33	479	634
		S. 1926	354	1	42	10	74	481	600
		A. 1926	505	23	43	12	42	625	834

HAMILTON-OWEN SOUND HIGHWAY

Road No. 6

Traffic Census

DAILY AVERAGE

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
1	Clappison's Corners.....	S. 1924	2,209	98	169	10	40	2,526	3,705
		A. 1924	1,498	28	176	9	43	1,754	2,720
		S. 1925	1,470	192	185	15	39	1,901	3,065
		A. 1925	1,305	28	209	14	33	1,589	2,017
2	Freelton.....	S. 1926	2,503	204	195	24	19	2,945	4,682
		1914	34	.....	.....	.....	107	141	238
		1922	516	.....	40	12	23	591	911
		S. 1924	916	31	81	9	46	1,083	1,718
3	South of Guelph, Lots 6 and 7, Puslinch Township	A. 1924	559	8	85	10	44	706	1,043
		S. 1925	503	38	59	8	27	635	1,075
		A. 1925	488	10	87	10	33	628	892
		S. 1926	1,140	68	95	14	28	1,345	2,289
4	North of Guelph at Elora Road.....	S. 1914	37	.....	2	.....	105	144	233
		1922	872	.....	60	16	43	991	1,582
		S. 1924	1,321	60	94	7	49	1,531	2,694
		A. 1924	655	14	101	7	55	832	1,180
5	South of Arthur.....	S. 1925	584	73	66	8	14	745	1,388
		A. 1925	696	6	100	8	54	864	1,161
		S. 1926	1,231	125	119	11	42	1,528	2,517
		S. 1924	873	20	41	4	55	993	1,546
5	South of Arthur.....	A. 1924	549	5	43	4	37	648	949
		S. 1925	797	31	50	4	35	917	1,457
		A. 1925	437	5	39	4	32	517	718
		S. 1926	1,044	62	106	7	25	1,244	1,831
5	South of Arthur.....	1922	227	.....	11	.....	107	345	433
		S. 1924	390	.....	10	.....	168	568	785
		A. 1924	254	2	21	.....	161	438	478
		S. 1925	401	18	21	.....	130	570	871
5	South of Arthur.....	A. 1925	178	2	10	.....	115	305	351
		S. 1926	1,126	34	32	4	151	1,347	2,683

6	South of Durham.....	1922	177	.....	5	.....	45	227	293
		S. 1924	248	.....	11	.....	37	299	475
		A. 1924	141	.....	7	.....	38	187	233
		S. 1925	251	.....	16	.....	32	314	453
		A. 1925	110	.....	6	.....	38	155	163
7	Just south of Chatsworth.....	S. 1926	370	.....	21	.....	24	444	529
		S. 1922	149	.....	1	.....	48	202	275
		S. 1924	402	.....	27	.....	49	486	618
		A. 1924	183	.....	13	.....	47	243	307
		S. 1925	355	.....	15	.....	46	430	648
		A. 1925	169	.....	9	.....	41	219	323
		S. 1926	381	.....	16	.....	33	454	638

PORT CREDIT-SARNIA HIGHWAY -Via Brampton, Guelph and Kitchener
Traffic Census
DAILY AVERAGE

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
1	Cooksville Corner.....	S. 1924 1,852 A. 1924 1,192 S. 1925 2,187 A. 1925 1,847 S. 1926 3,181	..... 6 65 17 66		171 177 255 267 298	6 15 13 14 35	46 50 27 28 35	2,075 1,440 2,547 2,173 3,615	2,929 2,318 4,483 3,949 8,057
2	North of Brampton at Brampton-Owen Sound Highway.....	1922 428 S. 1924 177 A. 1924 154 S. 1925 255 A. 1925 231 S. 1926 311	..... ..... 1 11 1 2		28 14 20 15 42 27	..... ..... ..... ..... 4	20 73 39 8 33 22	477 264 214 289 307 366	735 292 266 563 345 553
3	East of Guelph, Lot 11, Con. 2, Guelph Township..	1914 8 1922 180 S. 1924 494 A. 1924 327 S. 1925 671 A. 1925 403 S. 1926 888	..... ..... 4 25 6 32		3 17 51 57 63 60 64	..... ..... ..... ..... ..... ..... 10	44 41 47 37 41 44 29	55 238 596 423 800 513 1,023	86 308 906 637 1,385 605 1,358
4	West of Guelph, Concessions 4 and 5, Guelph Township.....	S. 1924 342 A. 1924 271 S. 1925 391 A. 1925 199 S. 1926 448 1914 43 1922 462 S. 1924 562 A. 1924 326 S. 1925 618 A. 1925 257 S. 1926 758	..... 1 58 3 33 11 64 1 1 25		23 31 39 27 42 3 41 32 19 46 22 60	1 10 10	19 30 6 21 24 92 29 46 28 35 32 23	385 333 451 494 250 557 138 532 651 374 763 312 876	660 451 717 367 817 240 745 972 524 1,073 396 1,273
5	East of Kitchener at Breslau Road.....	S. 1924 452 S. 1924 493 A. 1924 250 S. 1925 311 S. 1926 1,000	16 6 13 105		33 33 27 29 71	2 2 7	38 43 36 34 57	541 577 326 378 1,217	709 949 635 529 1,824
6	Just west of Baden.....								
7	Shakespeare.....	1914 37 1922 138	..... .....		..... 10	..... .....	30	94 178	111 228

8	South of Stratford...	S. 1924	732	33	40	.....	50	855	1,261
		A. 1924	184	.....	111	.....	61	356	460
		S. 1925	659	81	37	1	24	802	1,545
		A. 1925	428	1	30	.....	41	500	647
		S. 1926	943	73	62	8	23	1,109	1,634
		A. 1914	78	.....	1	.....	228	395	.....
		S. 1922	546	.....	29	1	121	697	998
		A. 1924	861	60	30	.....	74	1,025	1,762
		S. 1924	516	12	44	.....	74	646	790
		A. 1925	915	130	56	.....	73	1,174	2,034
		S. 1925	373	10	42	.....	66	491	552
		A. 1926	965	94	56	8	67	1,190	1,624
		S. 1922	268	.....	21	.....	83	372	465
		A. 1924	358	17	17	.....	63	455	741
		S. 1924	277	11	13	3	60	364	509
		A. 1925	415	69	38	1	48	571	898
		S. 1925	338	4	29	4	76	451	692
		A. 1926	589	86	40	9	44	768	1,087
10a	Elginfield (Stratford)....	S. 1922	41	.....	3	.....	26	69	92
		A. 1924	113	6	6	.....	16	141	224
		S. 1924	78	4	5	.....	29	116	157
		A. 1925	128	75	8	2	12	225	313
		S. 1925	96	9	4	2	15	126	151
		A. 1926	325	82	13	10	13	443	687
		S. 1922	3	.....	1	.....	5	8	11
		A. 1924	19	43	2	.....	5	69	92
		S. 1924	37	4	3	.....	10	54	78
		A. 1925	91	72	5	.....	6	174	245
		S. 1925	66	10	2	.....	4	82	106
		A. 1926	173	83	7	.....	5	268	429
		S. 1924	160	304	36	1	95	596	832
		A. 1924	137	16	10	.....	53	216	283
		S. 1925	202	118	16	1	22	370	565
		A. 1925	137	18	13	.....	42	210	269
		S. 1926	269	153	19	2	28	471	549
		A. 1924	130	200	7	.....	8	345	518
		S. 1924	33	19	1	.....	3	56	155
		A. 1925	57	95	5	2	3	162	252
		S. 1925	37	24	5	1	4	71	96
		A. 1926	112	136	8	3	1	260	383
		S. 1914	21	.....	.....	.....	111	132	209
		A. 1922	840	17	9	.....	62	928	1,366
		S. 1924	325	366	18	.....	41	750	1,001
		A. 1924	254	132	9	.....	44	439	843
		S. 1925	228	518	20	1	28	787	1,125
		A. 1925	158	80	17	.....	36	291	387
		S. 1926	659	874	28	2	34	1,597	2,028
10b	Elginfield (Sarnia)	S. 1924	19	43	2	.....	5	69	92
		A. 1924	37	4	3	.....	10	54	78
		S. 1925	91	72	5	.....	6	174	245
		A. 1925	66	10	2	.....	4	82	106
		S. 1926	173	83	7	.....	5	268	429
		A. 1924	160	304	36	1	95	596	832
		S. 1924	137	16	10	.....	53	216	283
		A. 1925	202	118	16	1	22	370	565
		S. 1925	137	18	13	.....	42	210	269
		A. 1926	269	153	19	2	28	471	549
		S. 1924	130	200	7	.....	8	345	518
		A. 1924	33	19	1	.....	3	56	155
		S. 1925	57	95	5	2	3	162	252
		A. 1925	37	24	5	1	4	71	96
		S. 1926	112	136	8	3	1	260	383
		A. 1914	21	.....	.....	.....	111	132	209
		S. 1922	840	17	9	.....	62	928	1,366
		A. 1924	325	366	18	.....	41	750	1,001
		S. 1924	254	132	9	.....	44	439	843
		A. 1925	228	518	20	1	28	787	1,125
		S. 1925	158	80	17	.....	36	291	387
		A. 1926	659	874	28	2	34	1,597	2,028
11	West of Parkhill at Kerwood Road...	S. 1924	19	43	2	.....	5	69	92
		A. 1924	37	4	3	.....	10	54	78
		S. 1925	91	72	5	.....	6	174	245
		A. 1925	66	10	2	.....	4	82	106
		S. 1926	173	83	7	.....	5	268	429
		A. 1924	160	304	36	1	95	596	832
		S. 1924	137	16	10	.....	53	216	283
		A. 1925	202	118	16	1	22	370	565
		S. 1925	137	18	13	.....	42	210	269
		A. 1926	269	153	19	2	28	471	549
		S. 1924	130	200	7	.....	8	345	518
		A. 1924	33	19	1	.....	3	56	155
		S. 1925	57	95	5	2	3	162	252
		A. 1925	37	24	5	1	4	71	96
		S. 1926	112	136	8	3	1	260	383
		A. 1914	21	.....	.....	.....	111	132	209
		S. 1922	840	17	9	.....	62	928	1,366
		A. 1924	325	366	18	.....	41	750	1,001
		S. 1924	254	132	9	.....	44	439	843
		A. 1925	228	518	20	1	28	787	1,125
		S. 1925	158	80	17	.....	36	291	387
		A. 1926	659	874	28	2	34	1,597	2,028
12	East of Wisebeach...	S. 1924	19	43	2	.....	5	69	92
		A. 1924	37	4	3	.....	10	54	78
		S. 1925	91	72	5	.....	6	174	245
		A. 1925	66	10	2	.....	4	82	106
		S. 1926	173	83	7	.....	5	268	429
		A. 1924	160	304	36	1	95	596	832
		S. 1924	137	16	10	.....	53	216	283
		A. 1925	202	118	16	1	22	370	565
		S. 1925	137	18	13	.....	42	210	269
		A. 1926	269	153	19	2	28	471	549
		S. 1924	130	200	7	.....	8	345	518
		A. 1924	33	19	1	.....	3	56	155
		S. 1925	57	95	5	2	3	162	252
		A. 1925	37	24	5	1	4	71	96
		S. 1926	112	136	8	3	1	260	383
		A. 1914	21	.....	.....	.....	111	132	209
		S. 1922	840	17	9	.....	62	928	1,366
		A. 1924	325	366	18	.....	41	750	1,001
		S. 1924	254	132	9	.....	44	439	843
		A. 1925	228	518	20	1	28	787	1,125
		S. 1925	158	80	17	.....	36	291	387
		A. 1926	659	874	28	2	34	1,597	2,028
13	Wyoming Road...	S. 1924	19	43	2	.....	5	69	92
		A. 1924	37	4	3	.....	10	54	78
		S. 1925	91	72	5	.....	6	174	245
		A. 1925	66	10	2	.....	4	82	106
		S. 1926	173	83	7	.....	5	268	429
		A. 1924	160	304	36	1	95	596	832
		S. 1924	137	16	10	.....	53	216	283
		A. 1925	202	118	16	1	22	370	565
		S. 1925	137	18	13	.....	42	210	269
		A. 1926	269	153	19	2	28	471	549
		S. 1924	130	200	7	.....	8	345	518
		A. 1924	33	19	1	.....	3	56	155
		S. 1925	57	95	5	2	3	162	252
		A. 1925	37	24	5	1	4	71	96
		S. 1926	112	136	8	3	1	260	383
		A. 1914	21	.....	.....	.....	111	132	209
		S. 1922	840	17	9	.....	62	928	1,366
		A. 1924	325	366	18	.....	41	750	1,001
		S. 1924	254	132	9	.....	44	439	843
		A. 1925	228	518	20	1	28	787	1,125
		S. 1925	158	80	17	.....	36	291	387
		A. 1926	659	874	28	2	34	1,597	2,028

Road No. 8

NIAGARA FALLS-GODERICH HIGHWAY—Via Hamilton, Kitchener and Stratford

Traffic Census

DAILY AVERAGE

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
1	South end corner.....	S. 1924	2,404	978	342	60	77	3,861	5,808
		A. 1924	1,248	328	303	50	65	1,994	3,250
		S. 1925	2,125	2,065	400	48	56	4,694	6,050
		A. 1925	989	409	302	42	49	1,791	2,438
		S. 1926	2,287	2,088	293	69	39	4,776	7,423
2a	St. David's (Niagara Falls traffic).....	S. 1924	2,718	.....	126	12	17	2,873	5,082
		A. 1924	1,025	335	171	14	31	1,576	3,011
		S. 1925	1,593	1,670	173	20	17	3,474	5,070
		A. 1925	786	297	144	15	11	1,253	2,085
		S. 1926	2,079	2,097	210	36	16	4,438	8,003
2c	St. David's (St. Catharines traffic).....	S. 1924	2,106	978	111	15	21	3,231	5,788
		A. 1924	1,104	375	171	14	60	1,724	3,630
		S. 1925	1,803	1,897	177	23	37	3,937	5,618
		A. 1925	833	322	157	15	25	1,352	2,348
		S. 1926	2,228	2,291	236	40	28	4,823	8,055
3	Jordan Corners.....	1914	155	.....	.....	.....	123	278	471
		1922	2,098	.....	144	28	70	2,340	3,940
		S. 1924	2,325	997	161	28	12	3,523	6,159
		A. 1924	1,039	253	165	26	25	1,508	2,865
		S. 1925	1,803	1,481	266	32	19	3,601	5,448
4	Grimsby Park Road.....	A. 1925	895	203	188	32	9	1,327	1,950
		S. 1926	2,528	1,603	241	44	4	4,420	7,044
		1922	2,074	.....	164	5	74	2,317	4,040
		S. 1924	1,744	1,288	241	4	50	3,327	5,374
		A. 1924	1,159	269	260	2	38	1,728	3,150
5	At Stoney Creek Road.....	S. 1925	2,365	1,800	303	31	42	4,541	7,037
		A. 1925	928	270	241	24	13	1,476	2,079
		S. 1926	4,209	2,197	361	46	28	6,841	11,593
		1914	112	.....	2	.....	75	189	253
		1922	2,607	.....	148	1	93	2,849	5,030
S. 1924		1924	3,629	521	245	5	13	4,413	6,578
		A. 1924	1,686	171	320	2	26	2,205	3,432
		S. 1925	2,765	1,806	324	34	12	4,931	7,157

6	Bullock's Corners.....	A. 1925 S. 1926	1,314 3,877	217 1,876	259 410	26 55	12 13	1,828 6,231	2,753 9,735
		A. 1922 S. 1924	50 840	..... 70	2 114	..... 17	224 119	276 1,082	441 1,603
		A. 1924 S. 1925	1,320 903	10 116	130 162	13 14	73 80	1,610 1,168	2,271 1,643
		A. 1925 S. 1926	1,335 842	20 136	176 159	14 15	47 46	1,688 1,088	2,521 1,279
	Just west of Baden (this station is the same as 7-6)	A. 1924 S. 1925	1,401 452	16 6	167 33	2 2	38 43	1,765 541	2,687 709
		A. 1924 S. 1925	493 250	13 13	33 27	..... .....	36 34	326 378	635 529
		A. 1925 S. 1926	311 1,000	4 105	29 71	..... 7	34 57	1,217 94	1,824 111
	Shakespeare (this station is the same as 7-7).....	A. 1914 S. 1922	37 138	..... 33	..... 10	..... .....	30 50	178 856	228 1,261
		A. 1924 S. 1925	732 184	..... 81	40 111	..... 1	61 24	356 802	460 1,545
		A. 1925 S. 1926	659 428	1 73	37 30	..... 8	41 23	500 1,109	647 1,634
	East of Sebringville at St. Mary's Road.....	A. 1914 S. 1922	64 800	..... 60	62 25	..... 8	129 56	193 889	318 1,493
		A. 1924 S. 1925	1,354 704	2 47	53 41	..... .....	57 70	1,524 817	2,861 1,048
		A. 1925 S. 1926	872 549	43 43	46 35	..... 2	42 54	1,007 641	1,709 791
	South of Seaforth at Tuckersmith-Hibbett Townline	A. 1922 S. 1924	1,054 185	..... 20	53 10	..... .....	53 50	1,204 245	1,516 357
		A. 1924 S. 1925	377 159	15 15	16 15	..... 2	42 33	455 207	727 257
		A. 1925 S. 1926	304 158	..... 9	24 16	..... 1	56 42	401 218	572 385
	South of Goderich at Lot 9, Con. 7, Goderich Town- ship.....	A. 1925 S. 1926	421 365	21	17 23	..... 3	53 95	451 308	751 400
		A. 1924 S. 1925	206 341	..... 2	4 9	..... .....	32 33	382 237	650 294
		A. 1925 S. 1926	190 421	..... 21	12 17	..... 1	24 24	484 484	722 722
			Under construction. Under construction.						

Road No. 8a

BURLINGTON BEACH HIGHWAY

Traffic Census

DAILY AVERAGE

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
1	At intersection of Beach Road.....	A. 1924	733	61	139	.....	17	960	1,675
		S. 1925	2,654	537	208	2	51	3,452	5,608
		A. 1925	853	74	159	1	28	1,115	2,268
2	Beach Road at intersection of Burlington Beach Highway.....	S. 1926	5,040	1,042	335	11	26	6,454	10,962
		A. 1924	458	10	67	.....	23	548	753
		S. 1925	1,539	150	162	1	45	1,897	2,105
		A. 1925	624	22	121	.....	43	810	1,039
		S. 1926	3,534	347	258	3	36	4,178	7,483

ARTHUR-KINCARDINE HIGHWAY

Traffic Census
DAILY AVERAGE

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
1	South of Arthur.....	S. 1924	150	6	1	.....	74	231	299
		A. 1924	103	1	7	.....	93	204	280
		S. 1925	215	3	8	.....	72	298	424
		A. 1925	49	.....	2	..... 1	31	83	99
		S. 1926	436	7	13	.....	99	555	981
2	Teviotdale.....	S. 1924	48	.....	4	.....	13	65	77
		A. 1924	39	.....	8	.....	6	53	63
		S. 1925	80	.....	5	.....	7	93	178
		A. 1925	93	1	7	.....	106	207	156
		S. 1926	366	19	21	.....	16	422	669
3	North limits of Clifford Village.....	S. 1924	348	9	19	.....	58	434	636
		A. 1924	221	5	16	.....	68	310	418
		S. 1925	322	29	29	..... 1	82	455	612
		A. 1925	175	1	13	.....	73	262	305
		S. 1926	397	20	23	.....	55	495	666
4	Kinloss.....	S. 1924	99	6	7	.....	27	139	211
		A. 1924	71	2	2	.....	25	114	25
		S. 1925	146	13	7	.....	17	183	298
		A. 1925	39	.....	2	.....	13	54	76
		S. 1926	207	13	13	.....	12	245	372

BRAMPTON-OWEN SOUND HIGHWAY

Road No. 10

Traffic Census

DAILY AVERAGE

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
1	North of Brampton at Brampton-Guelph Highway.	1922	702	.....	123	.....	150	975	1,124
		S. 1924	682	..... 2	49	.....	56	789	1,114
		A. 1924	515	..... 2	64	.....	62	643	838
		S. 1925	555	..... 25	55	.....	18	653	963
		A. 1925	385	.....	69	.....	33	487	573
2	North of Orangeville.....	S. 1926	886	..... 4	70	..... 2	26	988	1,705
		S. 1922	191	.....	6	.....	56	253	334
		S. 1924	456	..... 8	33	.....	49	546	788
		A. 1924	295	.....	17	.....	39	351	398
		S. 1925	471	..... 13	27	.....	46	557	791
3	Flesherton.....	A. 1925	248	..... 1	16	.....	62	327	392
		S. 1926	624	..... 12	37	.....	34	707	963
		S. 1922	154	.....	2	.....	62	219	419
		S. 1924	537	..... 3	29	..... 9	95	673	766
		A. 1924	454	.....	36	..... 9	99	598	708
4	North of Chatsworth.....	S. 1925	628	..... 19	30	..... 11	72	760	933
		A. 1925	281	.....	27	..... 10	78	396	*520
		S. 1926	786	..... 19	53	..... 13	65	936	1,128
		S. 1914	13	.....	.....	.....	51	64	76
		S. 1922	207	.....	..... 13	.....	42	262	377
		S. 1924	501	..... 9	36	.....	68	614	734
		A. 1924	233	.....	15	.....	59	307	399
		S. 1925	141	..... 4	6	.....	28	179	287
		A. 1925	57	.....	2	.....	35	94	155
		S. 1926	173	..... 7	8	.....	13	201	287

TORONTO-SEVERN HIGHWAY

Road No. 11

Traffic Census
DAILY AVERAGE

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
0	Lansing Corner.....	S. 1925	3,754	530	583	2	56	4,925	6,613
		A. 1925	2,113	13	561	2	54	2,743	3,281
		S. 1926	5,366	282	417	21	47	6,133	8,601
1	Langstaff Corner.....	S. 1914	239	.....	10	.....	88	337	500
		S. 1922	1,334	.....	118	.....	38	1,490	2,408
		S. 1924	3,726	85	255	30	36	4,132	7,192
		A. 1924	2,177	29	451	17	72	2,746	4,290
		S. 1925	3,094	245	270	2	19	3,630	6,017
		A. 1925	1,521	11	260	5	38	1,835	2,155
		S. 1926	4,796	302	298	13	26	5,435	8,930
2	Top of South Holland Landing Hill.....	S. 1922	686	.....	14	.....	23	723	1,221
		S. 1924	1,315	70	44	.....	22	1,451	2,444
		A. 1924	1,487	9	38	.....	17	551	961
		S. 1925	1,296	166	49	.....	8	1,519	2,702
		A. 1925	545	9	56	4	17	631	746
		S. 1926	2,662	249	76	10	7	3,004	5,537
3	South of Barrie.....	S. 1922	544	.....	19	1	26	590	1,921
		S. 1924	1,105	60	40	1	22	1,227	1,976
		A. 1924	365	5	27	.....	19	416	687
		S. 1925	1,090	135	36	1	16	1,278	2,139
		A. 1925	337	3	25	3	24	392	562
		S. 1926	2,059	200	60	7	14	2,340	4,180
4	Crown Hill.....	S. 1924	610	58	14	.....	21	703	1,064
		A. 1924	229	2	11	3	18	263	404
		S. 1925	652	129	20	.....	14	815	1,232
		A. 1925	193	.....	11	.....	14	224	302
		S. 1926	1,280	132	23	6	7	1,448	2,416
5	South limits of Orillia.....	S. 1922	381	.....	9	6	52	448	618
		S. 1924	1,053	65	43	7	44	1,222	1,692
		A. 1924	564	6	41	9	59	679	916
		S. 1925	1,132	136	57	8	38	1,371	1,802
		A. 1925	491	7	46	6	32	582	766
		S. 1926	1,783	192	62	14	30	2,081	3,183
6	South of Washago at Sparrow Lake Road.....	S. 1922	273	.....	10	.....	22	305	395
		S. 1924	869	57	29	.....	20	975	1,685
		A. 1924	209	6	10	.....	11	236	356
		S. 1925	817	132	32	.....	10	991	1,530
		A. 1925	190	2	12	.....	10	214	307
		S. 1926	1,127	164	47	2	7	1,347	1,758

Road No. 12

WHITBY-LINDSAY HIGHWAY

Traffic Census

DAILY AVERAGE

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
1	One-quarter mile south of Brooklyn.....	1922	273	.....	24	.....	37	334	456
		S. 1924	899	19	51	.....	36	1,005	1,662
		A. 1924	405	.....	35	.....	49	489	700
		S. 1925	604	41	48	.....	25	718	1,308
		A. 1925	287	1	48	.....	42	378	418
2	Manchester Corner.....	S. 1926	Closed to traffic.						
		S. 1922	392	.....	30	.....	49	471	714
		S. 1924	783	21	29	.....	28	861	1,572
		A. 1924	321	1	23	.....	25	370	574
		S. 1925	545	30	30	1	32	638	1,289
3	West of Lindsay, Lots 12-13, Brock Township.....	A. 1925	213	1	25	1	31	271	339
		S. 1926	813	41	37	5	43	939	1,630
		S. 1924	336	5	9	.....	22	372	551
		A. 1924	162	1	8	.....	201	266	266
		S. 1925	332	25	7	.....	18	382	647
4	West limits of Lindsay.....	A. 1925	160	.....	10	.....	22	192	228
		S. 1926	605	19	14	3	15	656	1,208
		S. 1922	190	.....	7	.....	334	268	334
		S. 1924	559	10	16	.....	31	616	819
		A. 1924	314	3	22	.....	37	376	497
		S. 1925	572	28	38	.....	43	681	1,016
		A. 1925	275	2	23	.....	27	327	475
		S. 1926	756	27	39	4	28	854	1,159

Road No. 12a

PORT HOPE-PETERBOROUGH HIGHWAY

Traffic Census

DAILY AVERAGE

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
1	At Welcome Road.....	1922	287	.....	18	1	100	406	504
		S. 1924	600	35	24	1	58	718	1,221
		A. 1924	321	6	31	.....	71	429	589
		S. 1925	Not taken.						
		A. 1925	196	2	23	.....	53	274	339
2	South of Peterborough at Concessions 7 and 8, Monaghan Township.....	S. 1926	653	88	48	4	51	844	1,195
		1914	18	.....	.....	.....	42	60	109
		1922	393	.....	18	.....	20	432	654
		S. 1924	491	31	29	.....	18	569	1,062
		A. 1924	291	3	38	.....	23	355	591
		S. 1925	467	51	33	.....	19	570	910
		A. 1925	211	2	27	.....	19	259	373
		S. 1926	516	63	38	3	18	638	1,073

PICTON-FOXBORO HIGHWAY

Traffic Census
DAILY AVERAGE

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
1	Bloomfield.....	S. 1924	485	17	27	2	95	626	1,024
		A. 1924	149	.....	13	1	56	219	238
		S. 1925	318	9	18	2	34	381	815
		A. 1925	228	1	15	5	61	310	353
		S. 1926	337	20	28	2	74	461	660
2	Rossmore.....	S. 1922	381	.....	35	.....	101	517	717
		S. 1924	564	.....	55	1	88	708	989
		A. 1924	368	1	62	6	84	521	797
		S. 1925	797	49	72	1	50	969	1,264
		A. 1925	278	1	30	3	38	350	480
3	Foxboro.....	S. 1926	507	31	57	1	28	624	1,053
		S. 1922	258	.....	23	.....	118	399	539
		S. 1924	405	.....	30	.....	64	499	768
		A. 1924	299	2	34	.....	53	388	598
		S. 1925	466	26	31	.....	40	563	803
		A. 1925	269	3	28	.....	29	329	461
		S. 1926	452	22	39	1	47	561	880

KINGSTON-OTTAWA HIGHWAY

Road No. 15

Traffic Census

DAILY AVERAGE

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
1	Barrie field.....	S. 1924 A. 1924 S. 1925	404 362 573	27 6 102	46 30 46	1 1 1	67 76 65	545 475 787	643 699 972
2	Seeley's Bay.....	A. 1925 S. 1926 S. 1924 A. 1924 S. 1925 A. 1925 S. 1926 S. 1922	314 607 188 143 288 121 282 347	8 86 24 3 69 3 54	41 61 18 11 15 14 16 18	4 2 3 3 2	59 49 24 32 26 18 14 106	426 805 254 189 401 159 368 673	670 1,087 394 231 614 294 594 517
3	Lombardy.....	S. 1924 A. 1924 S. 1925 A. 1925 S. 1926 S. 1924	289 161 393 201 438	7 3 93 6 55	14 9 19 13 21	..... ..... 3 2 2	152 106 119 93 119	416 262 836 315 635	501 342 422 766 259
4	Lot 7, Concession 3, Drummond Township.....	S. 1924 A. 1924 S. 1925 A. 1925 S. 1926 S. 1924	142 117 122 255 945	3 1 3 3 17	27 6 10 11 60	..... ..... 2 2 1	23 27 19 28 83	195 202 365 164 1,106	202 202 578 229 483
5	Bell's Corners.....	A. 1925 S. 1926 S. 1924 A. 1924 S. 1925 A. 1925 S. 1926	524 498 366 646	19 82 6 35	45 60 40 38	..... 2 2 3	74 64 47 28	662 708 461 750	1,220 1,663 658 1,221
6	Carleton Place, junction of the Smith's Falls-Carleton Place Highway.....	S. 1925	407	39	30	2	32	510	761

OTTAWA-PRESCOTT HIGHWAY

Road No. 16

Traffic Census

DAILY AVERAGE

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
1	At the Ottawa-Perth Highway.....	1914	11	.....	.....	.....	83	94	101
		1922	468	.....	24	3	35	530	.....
		S. 1924	796	40	57	8	62	963	1,194
		A. 1924	702	28	64	.....	78	872	1,414
		S. 1925	1,276	145	82	17	60	1,580	1,905
		A. 1925	443	37	48	12	61	601	857
2	Concessions 1 and 2, Oxford Township.....	S. 1926	1,254	181	112	8	55	1,610	2,171
		S. 1922	376	.....	37	5	144	562	.....
		S. 1924	444	59	20	1	36	560	816
		A. 1924	217	21	15	.....	27	280	427
		S. 1925	315	106	26	6	30	483	812
		A. 1925	164	21	18	7	27	237	371
3	Johnstown Corners.....	S. 1926	495	131	34	11	25	696	1,156
		S. 1922	410	.....	12	9	48	479	808
		S. 1924	410	70	18	.....	19	517	871
		A. 1924	184	20	12	.....	12	228	339
		S. 1925	263	151	22	6	10	452	545
		A. 1925	111	47	17	.....	20	195	248
		S. 1926	539	195	29	7	10	780	1,326

POINT FORTUNE-PEMBROKE HIGHWAY—Via Ottawa

Road No. 17

Traffic Census

DAILY AVERAGE

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
1	Point Fortune.....	1922 S. 1924 A. 1924 S. 1925 A. 1925 S. 1926	135 213 109 170 64 233	..... 21 107 238 52 241	4 7 7 14 16 27	..... 2 1 4 1	38 46 37 40 31 34	177 289 261 465 163 536	294 498 851 797 256 887
2	1 mile west of Alfred.....	1922 S. 1924 A. 1924 S. 1925 A. 1925 S. 1926	156 172 130 200 112 299	..... 18 60 165 31 182	6 12 9 8 13 25	..... 2 17 12 10	99 94 138 82 101 159	303 293 528 250 617 198	305 512 689 802 901 344
3	At Quarries.....	1914 1922 S. 1924 A. 1924 S. 1925 A. 1925 S. 1926	39 677 517 408 514 196	..... ..... 38 84 223 47	..... 96 47 60 74 55	..... 27 26 28 20 19	..... 123 97 109 137 66	198 923 725 689 968 383	344 2,766 1,251 1,313 1,226 505
4	Lots 15 and 16, Concessions 3 and 4, March Twp. . .	S. 1926 S. 1924 A. 1924 S. 1925 A. 1925 S. 1926	586 178 107 169 121 283	243 2 7 3 41	83 21 15 25 45 18	21 2 5	83 35 32 15 20 88	1,016 237 161 204 169 367	1,485 443 246 284 176 796
5	Lots 20 and 21, Concessions 3 and 4, Fitzroy Twp. . .	1922 S. 1924 A. 1924 S. 1925 A. 1925 S. 1926	256 328 203 335 184 483	..... 5 7 21 5 27	23 23 14 26 23 33	..... ..... ..... 9 17	45 330 30 35 26 24	401 263 421 352 247 586	556 330 493 352 815 82
6	Lot 21, Concession 1, Admaston Township.....	1922 S. 1924 A. 1924 S. 1925 A. 1925 S. 1926	41 131 98 172 94 196	1 4 2 22 5 17	1 4 3 12 9 12	..... ..... ..... 2 1	20 18 25 17 17 97	67 158 121 233 126 242	82 258 167 369 156 374
7	Lot 7, Concessions 1 and 2, Ross Township.....	S. 1924 S. 1924 A. 1925 S. 1925 A. 1925 S. 1926	193 139 233 112 256	..... 3 14 2 11	10 7 11 6 16	..... ..... 4	84 84 96 77	300 233 346 216 360	383 260 465 367 418

LABOUR DAY TRAFFIC CENSUS, 1914-1926

Location of Observer	Year	Ontario	Foreign	Trucks	Busses	Horse-drawn Vehicles	Total
Toronto-Hamilton Highway at Long Branch.....	1914	262	.....	3	.....	255	520
	1916	1,876	.....	142	.....	455	2,473
	1917	3,065	.....	107	.....	189	3,361
	1918	4,429	.....	93	.....	71	4,593
	1920	7,783	.....	131	.....	41	7,955
	1922	11,706	.....	368	78	41	12,193
	1924	11,108	4,691	500	223	47	16,569
	1925	11,265	5,886	432	331	27	17,941
	1926	12,392	6,279	491	298	24	19,484
Kingston Road at Old Kingston Road.....	1926	11,352	1,378	256	76	29	13,091 _e
Yonge Street at Lansing.....	1926	8,007	1,230	364	10	42	9,653
Bloor and Dundas Streets, Islington.....	1926	10,603	2,130	370	60	15	11,048
Danforth and Markham Road.....	1926	9,597	544	201	64	31	10,437

COUNTY ROAD TRAFFIC CENSUS—APPENDIX No. 24

SUMMARY OF COUNTY ROADS' TRAFFIC FOR THE YEARS—1924, 1925 and 1926

Name of County	No. of Stations			Average Daily Average				Average Daily Maximum					
	1924	1925	1926	Sum. 1924	Aut. 1924	Sum. 1925	Aut. 1925	Sum. 1926	Sum. 1924	Aut. 1924	Sum. 1925	Aut. 1925	Sum. 1926
Brant.....	7	12	12	275	196	235	133	234	391	265	344	175	275
Bruce.....	7	9	7	132	105	117	124	179	171	143	198	145	225
Carleton....	7	17	16	282	237	227	126	243	401	333	297	192	386
Dufferin....	1	6	6	103	61	132	89	152	138	111	196	116	218
Dundas....	3	7	7	359	311	346	233	343	451	434	471	305	460
Elgin.....	13	14	14	355	231	281	106	311	295	453	441	441	423
Essex.....	4	9	16	710	381	421	302	663	1,246	676	805	441	940
Frontenac..	3	7	7	350	222	287	141	247	514	349	406	207	386
Glengarry..	1	1	1	159	106	500	315	550	184	180	627	451	641
Grey.....	3	3	6	374	299	462	247	350	510	353	597	282	439
Haldimand..	3	5	6	196	186	269	121	221	332	281	375	170	282
Halton.....	1	7	7	.....	351	267	209	309	.....	447	419	295	445
Hastings....	3	4	5	225	153	216	108	183	341	234	294	151	275
Huron.....	8	9	12	290	183	229	173	403	402	225	350	248	592
Kent.....	6	14	11	386	229	288	170	302	643	293	432	239	388
Lambton....	7	10	16	171	110	304	117	247	288	187	482	160	342
Langark....	1	2	8	74	64	27	14	166	93	83	48	25	263
Leeds.....	5	9	9	126	108	128	91	155	159	144	180	144	204
Lennox and Addington..	3	3	5	84	91	73	76	91	119	118	105	125	131
Lincoln....	3	9	13	571	341	311	147	408	940	409	438	196	636
Middlesex..	10	12	11	354	194	380	198	272	511	264	548	261	337
Norfolk....	5	7	7	646	283	399	239	535	1,008	339	521	320	699
Northumberland and Durham..	2	4	4	174	144	106	87	181	314	173	142	125	243
Ontario....	2	5	6	415	187	254	134	340	758	246	432	328	566
Oxford.....	5	7	7	312	173	255	143	211	404	200	335	194	255
Peterborough..	8	6	7	322	169	392	134	312	475	243	564	142	438
Prescott....	.....	1	1	.....	.....	190	100	164	.....	.....	244	145	216
Prince Edward..	1	2	4	302	280	382	209	265	377	354	570	265	365
Peel.....	1	1	1	333	143	127	72	346	542	170	297	158	583
Perth.....	4	4	4	307	201	208	193	251	472	243	325	245	306
Renfrew....	4	6	6	176	128	151	100	161	246	172	209	142	214
Russell....	.....	.....	2	.....	.....	.....	.....	45	.....	.....	.....	.....	65

AVERAGE DAILY AVERAGE—SUMMER 1924

Name of County	No. of Stations	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum For one Day
		Ontario	Foreign					
Brant.....	6	185	36	16	1	37	275	391
Bruce.....	7	103	4	7		18	132	171
Carleton.....	7	212	1	28	4	37	282	401
Dufferin.....	1	77		18		8	103	138
Dundas.....	3	203	7	35	5	109	359	451
Elgin.....	13	294	17	55		23	355	561
Essex.....	4	524	72	55	5	54	710	1,246
Frontenac.....	3	261	14	27	4	44	350	514
Glengarry.....	1	45	1	23		90	159	184
Grey.....	3	301	3	18	3	49	374	510
Haldimand.....	3	154	7	14	2	19	196	332
Hatton.....	0							
Hastings.....	3	176		15		34	225	341
Huron.....	8	221	6	14	1	48	290	402
Kent.....	6	289	25	36		36	386	643
Lambton.....	7	113	36	6		16	171	288
Lanark.....	1	38				36	74	93
Leeds.....	5	90	5	10		21	126	159
Lennox and Addington.....	3	39	2	4		39	84	119
Lincoln.....	3	510		43	1	17	571	940
Middlesex.....	10	277	32	20		25	354	511
Norfolk.....	5	491	37	48	5	65	646	1,008
Northumberland and Durham.....	2	126	3	8		37	174	314
Ontario.....	2	378	5	14	1	17	415	758
Oxford.....	5	206	48	18	1	40	312	404
Peel.....	1	246		7		80	333	542
Perth.....	4	252	6	12		37	307	472
Peterborough.....	8	282	2	18	2	18	322	475
Prescott.....	0							
Prince Edward.....	1	244	6	11		41	302	377
Renfrew.....	4	128		8		40	176	246
Simcoe.....	7	206	3	8		20	237	354
Victoria.....	7	208	4	15		47	274	379
Waterloo.....	5	267	1	19	2	36	326	525
Welland.....	8	847	46	70	10	22	995	1,675
Wellington.....	6	166	4	6		38	214	360
Wentworth.....	6	340	3	39		39	421	535
York.....	5	1,054	3	127	28	38	1,250	1,830
In 36 counties, average per 1 station.....		9,553	439	838	75	1,375	12,280	18,649
In 1 county, average per 1 station.....		266	12	23	2	38	341	518
Percentage on whole.....		77.79	3.58	6.83	.61	11.19	1.00	

AVERAGE DAILY AVERAGE—AUTUMN, 1924

Name of County	No. of Stations	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
		Ontario	Foreign					
Brant.....	7	129	10	19	1	39	196	265
Bruce.....	7	76	.....	5	.....	24	105	143
Carleton.....	7	172	5	16	3	41	237	333
Dufferin.....	1	49	.....	5	.....	7	61	111
Dundas.....	3	203	7	24	6	71	311	434
Elgin.....	13	178	2	17	.....	35	231	295
Essex.....	5	262	41	34	3	41	381	676
Frontenac.....	3	161	7	22	2	30	222	349
Glengary.....	1	38	7	9	.....	52	106	180
Grey.....	3	221	1	26	3	48	299	353
Haldimand.....	3	126	4	20	1	35	186	281
Halton.....	1	276	3	46	.....	26	351	447
Hastings.....	4	117	1	13	.....	22	153	234
Huron.....	9	120	1	14	1	47	183	225
Kent.....	5	149	2	17	.....	61	229	293
Lambton.....	7	69	18	5	.....	18	110	187
Lanark.....	1	37	.....	.....	.....	27	64	83
Leeds.....	5	70	2	10	.....	26	108	144
Lennox and Addington.....	3	32	1	3	.....	55	91	118
Lincoln.....	3	231	16	48	1	45	341	409
Middlesex.....	11	136	12	17	.....	29	194	264
Norfolk.....	5	200	3	26	.....	54	283	339
Northumberland and Durham.....	2	90	.....	9	.....	45	173	144
Ontario.....	3	147	5	11	1	29	187	246
Oxford.....	4	120	.....	14	.....	33	173	200
Peel.....	1	74	2	4	.....	63	143	170
Perth.....	4	130	1	20	.....	50	201	243
Peterborough.....	8	129	1	22	.....	17	169	243
Prescott.....	0	.....	.....	.....	.....	.....	.....	.....
Prince Edward.....	1	199	4	22	1	54	280	354
Renfrew.....	4	85	2	5	.....	36	128	172
Simcoe.....	7	99	.....	10	.....	24	133	180
Victoria.....	7	137	.....	13	.....	49	199	285
Waterloo.....	6	167	.....	18	.....	38	225	307
Welland.....	8	417	107	78	11	40	653	1,060
Wellington.....	7	88	1	7	.....	41	137	188
Wentworth.....	5	157	1	20	.....	29	207	252
York.....	5	696	4	173	26	49	949	1,169
In 37 counties at 1 station.....	.....	5,787	271	820	62	1,430	8,370	11,405
In 1 county at 1 station.....	.....	157	7	22	2	39	227	308
Percentage on whole.....	.....	69.14	3.23	9.79	74	17.1	100	.....

AVERAGE DAILY AVERAGE—SUMMER, 1925

Name of County	No. of Stations	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
		Ontario	Foreign					
Brant.....	12	160	35	19	1	20	235	344
Bruce.....	9	88	7	8	.....	14	117	198
Carleton.....	17	164	7	15	2	39	227	297
Dufferin.....	6	115	2	5	.....	10	132	196
Dundas.....	7	204	17	22	2	101	346	471
Elgin.....	14	230	20	18	.....	13	281	453
Essex.....	9	261	81	43	2	34	421	805
Frontenac.....	7	226	21	19	2	19	287	406
Glengarry.....	1	247	97	51	.....	105	500	627
Grey.....	3	371	20	26	3	42	462	597
Haldimand.....	5	202	21	22	.....	24	269	375
Halton.....	7	220	8	31	.....	8	267	419
Hastings.....	4	169	10	16	.....	21	216	294
Huron.....	9	176	13	12	.....	28	229	350
Kent.....	14	203	46	18	1	20	288	432
Lambton.....	10	140	134	12	1	17	304	483
Lanark.....	2	17	.....	.....	.....	10	27	48
Leeds.....	9	77	12	10	1	28	128	180
Lennox and Addington.....	3	36	3	1	.....	33	73	105
Lincoln.....	9	227	28	33	.....	23	311	438
Middlesex.....	12	236	100	22	1	21	380	558
Norfolk.....	7	314	15	31	.....	39	399	521
Northumberland and Durham.....	4	79	3	7	.....	17	106	142
Ontario.....	5	211	8	15	.....	20	254	438
Oxford.....	7	162	48	16	.....	29	255	335
Peel.....	1	100	1	3	.....	23	127	297
Perth.....	4	166	7	11	.....	24	208	325
Peterborough.....	6	327	19	29	5	12	392	564
Prescott.....	1	47	7	1	8	127	190	254
Prince Edward.....	2	280	13	37	.....	52	382	570
Renfrew.....	6	102	3	7	1	38	151	209
Simcoe.....	7	208	12	12	.....	17	249	394
Victoria.....	5	325	8	24	.....	47	404	567
Waterloo.....	6	262	17	26	2	44	351	559
Welland.....	8	469	558	85	9	30	1,151	1,457
Wellington.....	7	145	6	10	.....	36	197	280
Wentworth.....	5	619	52	92	27	25	815	1,021
York.....	7	602	23	107	22	27	781	1,015
In 38 counties, average at 1 station.....		8,187	1,482	916	90	1,237	11,912	17,023
In 1 county, average at 1 station.....		215	39	24	3	33	314	448
Percentage on whole.....		68.73	12.44	7.69	.76	10.38	100	.....

AVERAGE DAILY AVERAGE AUTUMN, 1925

Name of County	No. of Stations	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
		Ontario	Foreign					
Brant.....	12	88	1	15	1	28	133	175
Bruce.....	6	90	.....	5	.....	29	124	145
Carleton.....	17	79	1	12	1	33	126	192
Dufferin.....	6	59	.....	7	.....	23	89	116
Dundas.....	7	128	4	13	2	86	233	305
Elgin.....	12	82	.....	12	.....	11	106	144
Essex.....	9	226	11	36	6	23	302	441
Frontenac.....	7	104	2	16	1	18	141	207
Glenora.....	1	167	27	25	.....	96	315	451
Grey.....	3	178	.....	19	3	47	247	282
Haldimand.....	5	83	1	10	.....	27	121	170
Halton.....	7	159	1	30	.....	19	209	295
Hastings.....	5	79	1	11	.....	17	108	151
Huron.....	10	113	1	12	1	46	173	248
Kent.....	10	125	9	15	1	20	170	239
Lambton.....	11	74	18	8	.....	17	117	160
Lanark.....	2	8	.....	.....	.....	6	14	25
Leeds.....	9	54	2	9	1	25	91	144
Lennox and Addington.....	3	38	.....	6	.....	32	76	125
Lincoln.....	15	98	3	20	.....	26	147	196
Middlesex.....	12	147	10	20	1	20	198	261
Norfolk.....	7	177	1	22	.....	39	239	320
Northumberland and Durham.....	4	59	1	7	.....	20	87	125
Ontario.....	5	96	.....	12	.....	26	134	328
Oxford.....	7	98	4	11	1	29	143	194
Peel.....	1	38	.....	3	.....	31	72	158
Perth.....	4	133	1	11	.....	48	193	245
Peterborough.....	6	104	.....	19	.....	11	134	142
Prescott.....	1	33	1	2	4	60	100	145
Prince Edward.....	2	142	.....	21	1	45	209	265
Renfrew.....	6	57	1	4	.....	38	100	142
Simcoe.....	7	108	1	8	.....	22	139	212
Victoria.....	5	184	.....	19	.....	50	253	349
Waterloo.....	6	111	1	15	2	40	169	255
Welland.....	8	376	108	64	6	30	584	733
Wellington.....	7	71	1	5	.....	37	114	162
Wentworth.....	5	444	7	76	22	25	574	741
York.....	10	859	10	229	21	65	1,184	1,648
In the 38 counties, average for 1 station.....	.....	5,269	230	829	75	1,265	7,668	10,636
In the 1 county, average for 1 station.....	.....	139	6	22	2	33	202	280
Percentage on whole.....	.....	68.72	2.99	10.81	.99	16.49	100	.....

COUNTY ROAD TRAFFIC—1924, 1925 and 1926

TRAFFIC CENSUS

DAILY AVERAGE

Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
		Ontario	Foreign					
BRANT COUNTY: Brant 1a—Cockshutt Rd. at Burtch.....	S. 1924	112	3	17	.....	42	174	263
	S. 1925	45	1	10	.....	23	79	118
	A. 1925	16	.....	2	.....	39	57	81
	S. 1926	47	2	11	.....	20	80	108
	S. 1924	184	4	22	.....	51	261	436
	A. 1924	24	.....	2	.....	29	55	74
Brant 1b—Oakland Rd. at Burtch.....	S. 1925	177	5	26	.....	55	263	322
	A. 1925	101	1	17	.....	57	176	273
	S. 1926	463	17	47	1	37	565	736
	S. 1924	22	.....	.....	.....	10	32	42
Brant 2a—Brantford-Galt Rd. at Dundas St. (Shipman's corners).....	A. 1924	123	.....	20	.....	23	166	241
	S. 1925	201	6	15	9	16	247	384
	A. 1925	92	2	19	9	20	142	211
	S. 1926	236	12	14	8	19	289	356
	S. 1924	93	.....	14	.....	23	130	177
Brant 2b—Dundas St. at Brantford-Galt Rd. (Shipman's corners).....	A. 1924	25	.....	2	.....	11	38	47
	S. 1925	43	2	4	.....	12	61	98
	A. 1925	14	.....	4	1	15	34	49
	S. 1926	49	2	2	.....	18	71	94
	S. 1924	628	207	51	.....	55	941	1,255
	A. 1924	430	63	55	.....	72	620	780
Brant 3a—Burford Rd. at New Durham Rd.....	S. 1925	450	342	41	.....	12	845	1,152
	A. 1925	210	2	39	.....	26	277	353
	S. 1926	313	32	17	.....	17	379	516
	S. 1924	27	.....	2	.....	20	49	54
Brant 3b—New Durham Rd. at Burford Rd.....	A. 1924	27	.....	1	.....	34	62	117
	S. 1925	156	33	19	.....	22	230	250
	A. 1925	103	.....	19	.....	8	130	202
	S. 1926	82	5	2	1	8	98	157

COUNTY ROAD TRAFFIC—1924, 1925 and 1926 Continued

Traffic Census

DAILY AVERAGE

Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
		Ontario	Foreign					
Brant 4a—Side road between Lots 3 and 4, Burford Township.....	S. 1925	42	.....	4	.....	7	53	75
	A. 1925	34	.....	5	.....	11	50	71
	S. 1926	100	2	13	.....	8	123	161
Brant 4b—Concession Road, Lots 13 and 14, Burford Township.....	S. 1925	97	2	9	.....	20	128	217
	A. 1925	68	.....	9	.....	36	113	155
	S. 1926	135	3	19	.....	18	175	207
Brant 5—Back-Mount Pleasant Rd. at Churches.....	S. 1925	45	1	8	.....	9	63	95
	A. 1925	33	.....	5	.....	19	57	80
	S. 1926	186	7	27	.....	14	234	293
Brant 5a—Mount Pleasant Rd. at Churches.....	S. 1925	454	25	54	1	17	551	1,031
	A. 1925	198	2	29	.....	31	260	318
	S. 1926	232	7	32	.....	16	287	357
Brant 5b—Township Rd. from West at Churches.....	S. 1925	28	.....	5	.....	8	41	57
	A. 1925	22	.....	3	.....	12	37	53
	S. 1926	26	.....	10	.....	8	44	62
2-13a—Onondaga Rd. at Cainsville.....	S. 1924	160	4	7	3	61	235	380
	A. 1924	165	2	20	.....	62	254	330
	S. 1925	186	5	27	.....	43	261	324
	A. 1925	164	1	33	.....	62	260	333
	S. 1926	373	17	34	2	38	464	559
BRUCE COUNTY:								
Bruce 1a—Chesley Rd. at Junction of Hanover Rd.....	S. 1924	102	.....	6	.....	20	128	153
	A. 1924	110	.....	8	.....	29	147	208
	S. 1925	103	4	9	.....	24	140	153
Bruce 1b—Hanover Rd. at Junction of Chesley Rd.....	A. 1925	88	.....	5	.....	41	134	205
	S. 1926	128	2	8	.....	22	160	204
	S. 1924	342	1	26	.....	44	413	540
	A. 1924	253	.....	20	.....	76	349	502
	S. 1925	244	15	26	3	38	324	651
	A. 1925	325	.....	18	.....	72	415	478
	S. 1926	486	18	24	2	46	576	653

	S. 1924	S. 1925	S. 1926	171	19	14			30	234	282
Bruce 2a—South of Southampton (Southampton-Kin- cartline Traffic)	A. 1924	87	1	87	1	6	.....	.....	32	126	139
	S. 1925	193	29	193	29	11	.....	.....	31	264	409
	A. 1925	84	1	84	1	7	.....	.....	31	123	164
Bruce 2b—South of Southampton (Paisley Rd. Traffic)	S. 1926	244	43	244	43	15	.....	1	25	328	420
	S. 1924	35	.....	35	.....	2	.....	.....	14	51	68
	A. 1924	27	.....	27	.....	2	.....	.....	20	49	58
	S. 1925	5	1	5	1	4	.....	.....	2	12	96
	A. 1925	31	.....	31	.....	2	.....	.....	24	57	86
	S. 1926	55	.....	55	.....	3	.....	.....	18	78	112
	S. 1925	117	5	117	5	14	.....	.....	14	150	168
	S. 1926	Not taken	.....	Not taken	.....	.....	.....	.....	5	15	20
	S. 1925	10	.....	10	.....	.....	.....	.....	16	70	105
	S. 1924	49	1	49	1	4	.....	.....	10	48	60
	A. 1924	38	.....	38	.....	.....	.....	.....	10	84	159
	S. 1925	67	3	67	3	4	.....	.....	7	67	110
	A. 1925	Closed to Traffic	.....	Closed to Traffic	.....	.....	.....	.....	1	18	29
	S. 1926	55	3	55	3	1	.....	.....	2	6	15
	S. 1924	13	4	13	4	.....	.....	.....	7	11	16
	A. 1924	4	.....	4	.....	.....	.....	.....	1	35	58
	S. 1925	35	1	35	1	.....	.....	.....	1	12	17
	A. 1925	7	.....	7	.....	.....	.....	.....	2	13	20
	S. 1926	31	3	31	3	.....	.....	.....	1	21	26
	S. 1924	9	2	9	2	.....	.....	.....	1	4	7
	A. 1924	11	.....	11	.....	.....	.....	.....	9	20	.....
	S. 1925	19	1	19	1	.....	.....	.....	69	465	660
	A. 1925	3	.....	3	.....	.....	.....	.....	59	393	597
	S. 1926	9	.....	9	.....	.....	.....	.....	58	422	365
	S. 1924	299	4	299	4	87	.....	6	46	263	394
	A. 1924	292	5	292	5	25	.....	12	52	524	898
	S. 1925	254	19	254	19	28	.....	6	48	236	371
	A. 1925	192	1	192	1	22	.....	2	44	221	318
	S. 1926	408	22	408	22	39	.....	3	37	278	363
	S. 1924	162	1	162	1	20	.....	5	29	153	211
	A. 1924	147	2	147	2	17	.....	11	33	249	359
	S. 1925	205	8	205	8	22	.....	6	.....	.....	.....
	A. 1925	109	1	109	1	12	.....	2	.....	.....	.....
	S. 1926	186	5	186	5	21	.....	4	.....	.....	.....
CARLETON COUNTY:											
Carleton 1a—At Morrisburg-Ottawa Rd., lots 20, 21, concessions 6 and 7, Osgoode Township	S. 1924	299	4	299	4	87	.....	6	69	465	660
	A. 1924	292	5	292	5	25	.....	12	59	393	597
	S. 1925	254	19	254	19	28	.....	6	58	422	365
	A. 1925	192	1	192	1	22	.....	2	46	263	394
	S. 1926	408	22	408	22	39	.....	3	52	524	898
Carleton 1b—Metcalfe Road, lots 20, 21, concessions 6 and 7, Osgoode Township	S. 1924	162	1	162	1	20	.....	5	48	236	371
	A. 1924	147	2	147	2	17	.....	11	44	221	318
	S. 1925	205	8	205	8	22	.....	6	37	278	363
	A. 1925	109	1	109	1	12	.....	2	29	153	211
	S. 1926	186	5	186	5	21	.....	4	33	249	359

COUNTY ROAD TRAFFIC—1924, 1925 and 1926—Continued

Traffic Census

DAILY AVERAGE

Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
		Ontario	Foreign					
Carleton 2—Morrisburg-Ottawa Rd., lot 3, concession 3, Gloucester Township.	S. 1924	520	.....	47	16	48	631	776
	A. 1924	383	12	28	.....	65	488	639
	S. 1925	600	39	71	4	95	809	915
	A. 1925	291	8	66	4	90	459	756
Carleton 3a—Stittsville-Carp Rd., at West Huntley Rd..	S. 1926	576	54	63	10	84	787	1,068
	S. 1925	173	7	9	.....	35	228	359
	A. 1925	101	.....	9	.....	29	145	204
	S. 1926	163	6	11	.....	29	209	321
Carleton 3b—West Huntley Rd., at Stittsville-Carp Rd..	S. 1925	22	.....	.....	.....	7	29	32
	A. 1925	10	.....	1	.....	5	16	30
	S. 1926	21	.....	1	.....	8	30	45
	A. 1925	28	.....	.....	.....	17	45	76
Carleton 4a—Almonte-Carp Rd., at Stittsville-Carp Rd..	S. 1925	18	.....	1	.....	40	59	110
	A. 1925	43	.....	1	.....	22	66	98
	S. 1926	189	4	9	.....	58	260	376
	A. 1925	93	1	8	.....	42	144	220
Carleton 4b—Stittsville-Carp Rd., at Almonte-Carp Rd..	S. 1926	169	4	10	.....	45	228	328
	S. 1925	32	1	15	.....	32	80	103
	A. 1925	20	.....	7	.....	20	62	47
	S. 1926	45	.....	8	.....	20	73	153
Carleton 5a—Bowesville Rd., at townline.	S. 1925	37	1	14	.....	29	81	98
	A. 1925	9	.....	1	.....	10	32	20
	S. 1926	51	.....	7	.....	21	79	161
	S. 1925	165	2	13	.....	97	277	373
Carleton 6a—Townline at River Rd.	A. 1925	53	.....	.....	.....	53	114	192
	S. 1926	63	2	9	.....	34	108	140
	S. 1925	115	2	7	.....	68	192	236
	A. 1925	54	.....	6	.....	60	120	143
Carleton 6b—River Rd., at Townline.	S. 1926	80	1	7	.....	41	129	189
	S. 1925	149	3	10	1	16	179	238
	A. 1925	36	.....	3	.....	29	68	109
	S. 1926	103	5	26	1	20	155	219

Carleton 7b—Bowesville Rd., at River Rd.....	S. 1925 A. 1925 S. 1926	93 71 462	3 28	11 13 49	1 19	21 24 43	129 108 601	144 173 1,127
15-5a—Richmond Rd., at Bell's Corners.....	S. 1924 A. 1924 S. 1925 S. 1926 A. 1925 S. 1926	189 122 176 88 455 119	2 5 6 1 30	14 13 16 13 46 18	..... ..... ..... ..... 2	37 242 173 33 322 173	601 347 252 33 322 119	1,127 347 252 33 322 173
17-4a—Lots 15, 16, Concessions 3 and 4, March Township	S. 1924 A. 1924 S. 1925 A. 1925 S. 1926	117 205 99 206	7 11 2 31	13 16 19 36	..... 1 4	19 20 24 31	565 909 257 461 193 308	909 257 461 193 308
17-5a—Galletta Rd., lots 20, 21, concessions 3 and 4, Fitzroy Township	S. 1924 A. 1924 S. 1925 A. 1925 S. 1926	136 118 227 90 330	..... 6 9 2 6	8 12 17 10 19	..... ..... 4 9	27 31 24 27 22	171 167 282 129 386	240 203 308 200 455
17-5b—Packenham Rd., lots 20, 21, concessions 3 and 4, Fitzroy Township	S. 1924 A. 1924 S. 1925 A. 1925 S. 1926	57 23 115 24 145	..... ..... 3 2	3 3 5 3 6	..... ..... 2 4	16 20 20 14 21	76 46 145 41 178	116 64 227 62 214
DUFFERIN (CONT'D): 10-2a—Hockley's Rd., lots 5, 6, concession 2, West Mono Mono Township.....	S. 1924 A. 1924 S. 1925 A. 1925 S. 1926 S. 1925 A. 1925 S. 1926	77 49 103 58 108 30 45 168 131 76 166	..... ..... 1 1 1 3 2 1 1	18 5 15 10 10 1 4 13 5 8 12	..... ..... ..... ..... ..... ..... ..... ..... ..... 1	8 7 14 22 9 5 20 22 23 38 26	103 61 133 83 128 36 91 70 206 161 124 205	138 111 184 125 164 47 91 258 270 139 280
Dufferin 1a—Arthur Rd., at Grand Valley Rd.....	S. 1925 A. 1925 S. 1926 S. 1925 A. 1925 S. 1926	18 17 49 195 70 113	..... ..... ..... 4 1 1	1 2 2 4 12 4	..... ..... ..... ..... ..... .....	2 10 9 6 24 3	21 29 60 209 107 121	35 88 353 107 139 194
Dufferin 1b—Grand Valley Rd. at Arthur-Orangeville Rd.	S. 1925 A. 1925 S. 1926 S. 1925 A. 1925 S. 1926	18 17 49 195 70 113	..... ..... ..... 4 1 1	1 2 2 4 12 4	..... ..... ..... ..... ..... .....	2 10 9 6 24 3	21 29 60 209 107 121	35 88 353 107 139 194
Dufferin 1c—Bellwood Rd., at Jct. Grand-Valley Rd., and Arthur-Orangeville Rd.....	S. 1925 A. 1925 S. 1926 S. 1925 A. 1925 S. 1926	18 17 49 195 70 113	..... ..... ..... 4 1 1	1 2 2 4 12 4	..... ..... ..... ..... ..... .....	2 10 9 6 24 3	21 29 60 209 107 121	35 88 353 107 139 194
Dufferin 2a—Hillburg Rd., at Reading....	S. 1925 A. 1925 S. 1926 S. 1925 A. 1925 S. 1926	18 17 49 195 70 113	..... ..... ..... 4 1 1	1 2 2 4 12 4	..... ..... ..... ..... ..... .....	2 10 9 6 24 3	21 29 60 209 107 121	35 88 353 107 139 194

COUNTY ROAD TRAFFIC—1924, 1925 and 1926—Continued

Traffic Census

DAILY AVERAGE

Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
		Ontario	Foreign					
Dufferin 2b—Fergus-Orangeville Rd., at Reading.....	S. 1925	215	2	6	.....	6	229	287
	A. 1925	81	1	13	.....	23	118	164
	S. 1926	174	4	8	.....	8	194	323
DUNDAS COUNTY:								
Dundas 1a—Morrisburg-Ottawa Rd., 1½ miles south of Winchester.....	S. 1924	284	7	44	4	147	486	554
	A. 1924	252	7	26	5	109	399	487
	S. 1925	397	27	32	3	114	573	783
	A. 1925	241	6	21	3	106	377	409
	S. 1926	390	28	33	3	100	554	700
Dundas 1b—Chesterville Rd., 1½ miles south of Winchester.....	S. 1924	109	1	27	4	116	257	379
	A. 1924	104	4	15	.....	38	161	293
	S. 1925	139	6	12	.....	26	183	283
	A. 1925	107	1	7	.....	32	147	190
	S. 1926	136	6	14	.....	18	174	261
2-33a—Morrisburg-Ottawa Rd., at Morrisburg.....	S. 1924	216	13	34	7	64	334	420
	A. 1924	253	10	31	14	64	372	522
	S. 1925	529	71	78	9	152	839	940
	A. 1925	240	17	43	10	104	414	623
	S. 1926	437	71	55	8	72	643	882
Dundas 2a—Crysler Rd. at Morewood.....	S. 1925	153	1	8	.....	122	284	422
	A. 1925	85	.....	3	.....	99	187	231
	S. 1926	176	2	10	.....	148	336	457
Dundas 2b—Chesterville Rd., at Morewood.....	S. 1925	192	2	8	.....	171	373	504
	A. 1925	120	.....	8	.....	155	283	360
	S. 1926	213	2	14	1	169	399	507
Dundas 3a—Williamsburg-Chesterville Rd., at Bouckhill Rd.....	S. 1925	1	7	9	.....	56	73	221
	A. 1925	85	3	7	.....	52	147	217
	S. 1926	126	7	8	.....	50	191	262
Dundas 3b—Road to Gallingtown at Bouckhill Rd....	S. 1925	18	1	4	.....	69	92	143
	A. 1925	18	.....	2	.....	53	73	108
	S. 1926	26	1	3	.....	71	101	154

COUNTY ROAD TRAFFIC—1924, 1925 and 1926—Continued

Traffic Census

DAILY AVERAGE

Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
		Ontario	Foreign					
ELGIN COUNTY—Continued Elgin 5a—Sheddon-Port Stanley Rd. at Fingal.....	S. 1924	276	13	24	.....	44	357	585
	A. 1924	249	.....	21	.....	81	351	438
	S. 1925	222	25	12	1	21	281	343
	A. 1925	Not taken	.....	.....	.....	.....	.....	.....
	S. 1926	288	19	19	.....	19	345	477
	S. 1924	343	17	29	.....	51	440	634
	A. 1924	372	1	28	.....	93	494	605
	S. 1925	307	27	18	.....	23	375	471
	A. 1925	Not taken	.....	.....	.....	.....	.....	.....
	S. 1926	297	18	20	.....	21	356	413
3-5a—At Wallacetown, Dutton-Tyrconnell Rd.....	S. 1924	264	3	13	.....	40	320	435
	A. 1924	215	3	13	.....	70	301	423
	S. 1925	210	9	8	.....	12	239	738
	A. 1925	82	1	10	.....	21	114	162
3-7a—New Harum (Belmont Rd.).....	S. 1926	189	4	9	.....	8	210	315
	S. 1924	136	6	11	.....	18	171	253
	A. 1924	281	7	27	.....	9	324	425
	S. 1925	117	6	11	.....	8	142	240
	A. 1925	67	1	8	.....	8	84	122
	S. 1926	137	5	10	.....	8	160	175
3-8a—Bayham Rd. at Provincial Highway, Lot 107, Malahide Township.....	S. 1924	85	3	10	.....	13	111	158
	A. 1924	77	1	9	.....	18	105	122
	S. 1925	93	12	15	.....	15	135	191
	A. 1925	49	2	7	.....	11	69	88
Elgin 6—Glencoe Rd. at Walker's Bridge, south of Village of Glencoe.....	S. 1926	85	13	11	.....	7	116	153
	S. 1925	38	1	2	.....	8	49	67
	A. 1925	20	.....	3	.....	9	32	44
	S. 1926	27	.....	2	.....	13	42	55
ESSEX COUNTY: County Roads— Essex 1b—Comber Rd. at Stoney Point.....	S. 1924	202	6	11	.....	53	272	524
	A. 1924	134	20	6	.....	58	218	279
	S. 1925	192	33	6	.....	39	270	226

	A.	S.	.....	18	5 18	31 31	146 281	219 548
Essex 2a—Cottam Rd. traffic, junction 9th Concession Rd. and Leamington-Staples Rd.	S.	1925	80	5	14	11	110	245
	A.	1925	160	19	35	9	224	402
	S.	1926	113	10	17	5	145	219
	S.	1925	212	10	35	62	319	549
Essex 2c—Leamington-Staples Rd. traffic	A.	1925	238	19	28	23	309	559
	S.	1926	276	7	35	18	336	556
	S.	1924	1,243	240	151	15	1,667	2,890
2-1a—Howard Ave. at Provincial Highway.	A.	1924	579	114	120	19	849	1,746
	S.	1925	851	465	143	14	1,489	3,270
	A.	1925	1,143	50	200	58	1,501	2,011
	S.	1926	1,970	275	519	48	2,961	3,958
2-3a Belle River-Cottam Rd. at Woodlee.	S.	1924	249	21	23	66	359	532
	A.	1924	232	17	17	30	296	475
	S.	1925	254	22	124	26	426	610
	A.	1925	Under construction					
	S.	1926	221	16	40	37	314	394
3-2a—Division Rd., south of Essex at the intersection of Windsor-Falbotville Highway	A.	1924	87	18	6	9	120	333
	A.	1925	Under construction					
	S.	1926	441	1	5	4	36	50
	S.	1926	241	241	40	5	725	1,084
Essex 3-a-Townline Rd. traffic between Colchester North and Malden Townships.	S.	1925	235	91	24	39	303	877
	A.	1925	102	3	17	13	140	205
	S.	1926	208	100	35	22	370	493
Essex 4a—Tecumseh Rd. at Junction of Pilette Rd.	S.	1926	1,821	202	322	52	2,424	3,030
Essex 5a—River Rd. at Towline Rd. between Anderdon and Sandwich West Townships.	S.	1926	626	256	68	9	959	1,722
Essex 6a—County Rd., No. 14 at Staples.	S.	1926	156	6	18	13	197	339
Township Roads—								
Essex 1a—Tecumseh Rd. at Stoney Point.	S.	1924	403	22	35	80	547	1,037
	A.	1924	276	35	22	92	425	577
	S.	1925	390	67	24	63	544	698
	A.	1925	134	8	8	43	185	253
	S.	1926	344	29	33	43	449	767
Essex 2b—Ninth Concession Rd. easterly at Leamington Staples Rd.	S.	1925	39	4	7	12	62	93
	A.	1925	54	5	13	10	83	133
	S.	1926	65	11	12	7	95	118
Essex 3b—Pike Rd. traffic at Junction Pike Rd. and Colchester North and Malden Townline.	S.	1925	97	30	11	38	175	377
	A.	1925	68	4	12	14	98	141
	S.	1926	136	49	25	17	228	331

COUNTY ROAD TRAFFIC—1924, 1925 and 1926—Continued

Traffic Census
DAILY AVERAGE

Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
		Ontario	Foreign					
ESSEX COUNTY—Continued								
Essex 4b—Pilette Rd. southerly from Tecumseh Rd.	S. 1926	524	39	111	24	18	716	955
Essex 5b—Townline Rd. between Anderdon and Sandwich West Townships at junction of River Rd.	S. 1926	204	12	34	.....	19	269	367
Essex 6b—Townline Rd. between Tilbury North and Mersea at Staples.....	S. 1926	99	3	8	2	15	127	173
FRONTENAC COUNTY:								
2-28a—Portland Rd. at Catarqui Corner.....	S. 1924	275	.....	15	1	45	336	420
	A. 1924	242	20	34	3	26	325	483
	S. 1925	462	24	26	3	38	553	749
	A. 1925	221	1	14	2	43	281	432
	S. 1926	363	25	29	3	35	455	717
Frontenac 1a—Kingston Mills Rd. at Tuttle's Hill.	S. 1924	172	14	16	4	16	222	381
	A. 1924	103	.....	3	1	18	125	256
	S. 1925	162	.....	22	3	12	208	429
	A. 1925	64	1	7	3	9	83	122
	S. 1926	162	9	12	3	9	195	387
Frontenac 1b—Storrington Rd. at Tuttle's Hill.	S. 1924	337	27	49	6	72	491	742
	A. 1924	139	.....	30	1	47	217	309
	S. 1925	219	30	47	2	22	320	373
	A. 1925	113	1	49	2	22	187	261
	S. 1926	185	19	38	2	13	257	328
Frontenac 2a—Harrowsmith-Yarker Rd. at Shibley's.	S. 1925	143	8	16	.....	18	185	234
	A. 1925	84	2	9	.....	19	114	173
Frontenac 2b—Portland Rd. at Shibley's.....	S. 1926	129	9	14	2	17	171	217
	A. 1925	107	6	10	.....	5	128	184
	S. 1925	57	1	4	.....	7	69	119
	S. 1926	93	7	9	2	6	117	142
Frontenac 3a—Bath Rd. at road leading to Westbrook ..	S. 1925	328	39	15	5	22	409	591
	A. 1925	119	4	14	2	13	152	206
Frontenac 3b—Road leading to Westbrook at Bath Rd. ..	A. 1926	305	22	24	3	9	363	673
	S. 1925	164	15	9	.....	17	205	281
	A. 1925	73	2	12	.....	12	99	133
	S. 1926	103	7	47	.....	11	168	238

COUNTY ROAD TRAFFIC—1924, 1925 and 1926—Continued

Traffic Census

DAILY AVERAGE

Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
		Ontario	Foreign					
HALDIMAND COUNTY—Continued Haldimand 2b—Selkirk-Nanticoke at Cheapside Rd.	S. 1925	115	4	11		20	150	175
	A. 1925	24		2		27	53	83
	S. 1926	142	5	15		18	180	237
	S. 1926	16		3		17	36	60
Haldimand 4a—Ohsweken Rd. at Hamilton-Jarvis Highway. way. HALTON COUNTY:	S. 1924	Not taken						
	A. 1924	276	3	46		26	351	447
	S. 1925	445	14	60		15	534	898
	A. 1925	314	1	38		13	366	523
Haltom 1a—Middle Rd. at Merton.	S. 1926	484	13	52	1	12	562	811
	S. 1925	91	1	27		7	126	168
	A. 1925	61		24		7	92	128
	S. 1926	104		33		4	141	182
Haltom 1b—Bronte's side road at Merton.	S. 1925	301	10	44		10	365	619
	A. 1925	155	1	39		14	209	258*
	S. 1926	369	14	45		10	438	725
	S. 1925	186	1	12		10	209	341
Haltom 2a—Milton-Bronte Rd. at Boyne.	A. 1925	198		25		46	269	467
	S. 1926	249	3	14	6	8	280	308
	S. 1925	82		5		4	91	130
	A. 1925	115		14		41	170	235
Haltom 2b—Boyne-Drumquim Rd. at Boyne.	S. 1926	137	2	6		5	150	193
	S. 1925	264	21	19		8	312	507
	A. 1925	112	2	24		10	148	182
	S. 1926	269	19	34		6	328	542
5-4a—Brant St. at junction of Dundas and Brant Sts.	S. 1925	171	6	50		7	234	269
	A. 1925	155		50		6	211	271
	S. 1926	212	4	46		4	266	356
	S. 1924	177		16		27	220	307
HASTINGS COUNTY: Hastings 1a—Hastings Rd. at Foxboro.	A. 1924	121	1	16		25	163	254
	S. 1925	249	14	17		22	302	416

Hastings 2—Maynooth Rd. at Bannockburn.....	A. 1925	143	1	14	15	173	248
	S. 1926	214	10	21	36	266	486
	S. 1924	124		12	36	172	254
	A. 1924	82		10	22	114	136
	S. 1925	103	4	22	20	149	197
	A. 1925	51		14	15	80	105
	S. 1926	148	11	12	22	194	243
Hastings 1b—Sterling Rd. at Foxboro.....	S. 1924	228		16	38	282	461
	A. 1924	178	1	18	28	225	344
	S. 1925	217	22	14	18	261	387
	A. 1925	126	2	14	14	156	213
	S. 1926	238	12	18	27	185	294
Napanee Rd. at Marysville.....	A. 1925	86		7	16	109	200
Hastings 3a—Wallbridge-Frankford Rd. at lots 24, 25, junction of Concession 5.....	A. 1925	36	12	10	25	153	178
	S. 1926	62	1	9	23	68	98
Hastings 3b—County Rd. No. 2A at Wallbridge Rd.....	A. 1925	39	1	3	21	88	131
	S. 1926	57	1	5	16	63	93
HURON COUNTY:							
Huron 1a—London at Brucefield.....	S. 1924	383	12	23	57	475	587
	A. 1924	248	4	24	65	341	389
	S. 1925	281	15	23	29	348	500
	A. 1925	156	1	13	46	216	275
	S. 1926	443	24	48	41	556	852
Huron 1b—Bayfield-Seaforth Rd. at Brucefield.....	S. 1924	419		23	66	508	649
	A. 1924	195	4	22	65	286	357
	S. 1925	227	12	16	33	288	495
	A. 1925	134		11	39	184	256
	S. 1926	428	17	33	37	515	792
	S. 1924	178	16	4	24	222	328
	A. 1924	82	2	4	32	120	163
	S. 1925	218	35	9	18	280	434
	A. 1925	91	1	7	26	125	151
	S. 1926	248	68	12	31	360	496
Huron 2b—Lucknow Rd. at Amberley.....	S. 1924	149	16	5	192	254	254
	A. 1924	71		3	30	104	128
	S. 1925	167	26	8	16	217	292
	A. 1925	72	1	6	18	97	119
	S. 1926	189	49	9	25	272	350
Huron 3a—Wingham-Listowel Rd. at Brussels-Wroxeter Rd.....	S. 1924	135		6	17	158	272
	A. 1924	69		5	15	89	120
	S. 1925	101	2	5	9	117	259
	A. 1925	40		2	13	55	75
	S. 1926	169	9	12	18	209	256

Kent 1b—Mitchell Bay Rd., at Chatham-Wallaceburg Rd.	A. 1924 S. 1925 A. 1925 S. 1926	77 120 160 243	1 10 2 23	11 13 20 31	51 21 44 11	140 164 226 316	177 217 304 408
Kent 2a—Kent Bridge-Harwich Rd., at Northwood-Chatham Rd.	S. 1924 A. 1924 S. 1925 A. 1925 S. 1926	17 28 37 7 14	..... ..... 2	2 4 3 1	9 97 24 11 2	28 129 66 18 17	30 164 73 35 24
Kent 2b—Northwood-Chatham Rd., at Kent Bridge Rd.	S. 1925 A. 1925 S. 1926 S. 1925 A. 1925 S. 1926	231 321 167 291 225 86	41 43 11 56 37 7	20 28 16 21 19 11	60 31 25 27 20 18	356 426 219 399 304 122	741 640 282 537 476 183
Kent 3b—Wallaceburg-Walpole Island Rd., at Fort Lambton Rd.	S. 1925 A. 1925 S. 1926	107 12 73	13 8	11 2 9	17 13 15	148 27 106	197 61 180
Kent 4a—Ridgetown-Highgate Rd., at Ridgetown-Thamesville Rd.	S. 1925 A. 1925 S. 1926	394 76 422	28 52	23 5 35	28 18 22	473 99 531	699 136 671
Kent 4b—Ridgetown-Thamesville Rd., at Ridgetown-Highgate Rd.	S. 1925 A. 1925 S. 1926	170 33 116	19 7	14 2 9	26 7 12	229 42 145	299 65 172
3-3a—Chatham Rd., at Cedar Springs.	S. 1924 A. 1924 S. 1925 A. 1925 S. 1926	757 247 574 150 726	55 5 327 8 254	121 38 56 36 65	20 30 17 24 35	962 320 976 218 1,081	1,528 400 1,923 270 1,312
3-4a—Ridgetown Rd., at Morpeth.	S. 1924 A. 1924 S. 1925 A. 1925 S. 1926	338 212 320 194 351	26 5 42 3 49	32 19 33 27 37	24 33 28 22 44	420 269 423 246 487	668 315 712 356 597
—Tilbury East and Tilbury North townline, south of Tilbury.	S. 1924	332	45	32	62	471	853
2-5a—Tupperville Rd., east of Chatham	S. 1925 A. 1925 S. 1926	158 76 121	13 2	21 9 25	5 11 2	197 96 150	262 146 196

COUNTY ROAD TRAFFIC—1924, 1925 and 1926—Continued

Traffic Census

DAILY AVERAGE

Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
		Ontario	Foreign					
KENT COUNTY—Continued Township Roads— Tilbury-Stevenson Rd., at Quinn.....	S. 1924	163	16	10	.....	78	267	427
	A. 1924	183	.....	11	.....	95	289	412
	S. 1925	210	52	19	.....	14	295	423
	A. 1925	Not taken	.....	.....	.....	.....	.....	.....
Kent 3a—Port Lambton Rd., at Wallaceburg-Walpole Island Rd.....	S. 1926	102	23	11	4	5	145	238
	S. 1924	190	.....	8	3	6	207	339
	A. 1924	73	9	10	2	11	105	152
	S. 1925	136	94	12	4	8	254	349
LAMBTON COUNTY: Lambton 1—Sarnia-Thedford Rd., at Aberarder.....	A. 1925	55	5	5	2	6	73	99
	S. 1926	133	97	6	4	9	249	332
	S. 1924	55	10	5	.....	13	83	194
	A. 1924	29	4	3	.....	11	47	60
Lambton 2a—Sarnia-Wallaceburg Rd., at Port Lambton Rd., west of Becher (Port Lambton Rd.)....	S. 1925	49	17	7	.....	6	79	144
	A. 1925	44	3	4	.....	11	62	92
	S. 1926	33	12	5	.....	6	56	99
	S. 1924	62	3	4	.....	20	89	179
Lambton 2b—Sarnia-Wallaceburg Rd., at Port Lambton Rd., west of Becher (Wilkesport Rd. traffic)....	A. 1924	37	1	2	.....	19	59	90
	S. 1925	39	2	5	.....	13	59	74
	A. 1925	7	.....	1	.....	13	21	30
	S. 1926	32	.....	4	.....	8	44	59
Lambton 2c—Sarnia-Wallaceburg Rd., at Port Lambton Rd., west of Becher (Florence Rd. Traffic).....	S. 1924	31	2	.....	.....	9	42	124
	A. 1924	15	.....	1	.....	14	30	43
	S. 1925	21	.....	1	.....	6	28	48
	A. 1925	8	.....	.....	.....	10	18	39
S. 1926	12	1	.....	1	.....	3	17	31

Lambton 2d—Sarnia-Wallaceburg Rd., at Port Lambton Rd., west of Becher (Wallaceburg Rd. traffic) . .	S. 1924 A. 1924 S. 1925 A. 1925 S. 1926	87 59 78 40 66	13 4 13 7 9	6 8 6 5 6	..... ..... ..... ..... .....	..... ..... ..... ..... .....	12 23 13 20 11	119 94 110 81 92	275 127 162 81 145
7-12a—Sarnia-London Rd., corner of Twenty-four side Rd.	S. 1924 A. 1924 S. 1925 A. 1925 S. 1926	105 74 116 64 187	210 101 459 79 711	3 3 7 7 8	..... ..... ..... ..... .....	..... ..... ..... ..... .....	3 1 10 5 4	321 179 593 156 912	431 462 890 225 1,240
7-13a—Sarnia-London Rd., at Wyoming Rd., (Wyoming Rd. traffic)	S. 1924 A. 1924 S. 1925 A. 1925 S. 1926	264 197 285 213 415	14 4 515 79 26	15 8 23 22 23	..... ..... ..... ..... .....	..... ..... ..... ..... .....	47 44 27 39 19	340 254 851 363 483	476 370 1,398 463 721
Lambton 1b—Aberarder Rd., between Concessions 10 and 11, Plympton Township.	S. 1925 A. 1925 S. 1926	Not taken 28 37	2 7	3 3	..... ..... .....	..... ..... .....	3 9	36 56	60 83
Lambton 3a—Alvinston-Oil City Rd., at intersection of Inwood-Shetland Rd.	S. 1925 A. 1925 S. 1926	87 33 148	4 7	7 5 11	..... ..... .....	..... ..... .....	20 11 24	118 49 190	162 59 255
Lambton 3b—Inwood-Shetland Rd., at intersection of Alvinston-Oil City Rd.	S. 1925 A. 1925 S. 1926	183 158 261	6 2 14	17 19 20	..... ..... .....	..... ..... .....	36 54 42	242 233 337	310 270 458
Lambton 4a—River Rd., at Port Lambton.	S. 1925 A. 1925 S. 1926	301 71 189	177 5 101	20 8 22	..... ..... .....	..... ..... .....	23 12 16	522 96 331	888 134 417
Lambton 4b—Florence Rd., at Port Lambton.	S. 1925 A. 1925 S. 1926	113 85 126	50 13 51	10 10 14	..... ..... .....	..... ..... .....	13 9 9	186 117 200	389 208 257
LANARK COUNTY:									
County Roads—									
Lanark 1—Perth-Franktown Rd., at Richardson.	S. 1924 A. 1924 S. 1925	38 37 Not taken	..... ..... .....	..... ..... .....	..... ..... .....	..... ..... .....	..... ..... .....	73 64	93 83
Lanark 1a—Townline Rd., to Ashton Station at West Huntley Rd.	S. 1925 A. 1925 S. 1926	6 4 6	..... ..... .....	..... ..... .....	..... ..... .....	..... ..... .....	..... ..... .....	17 9 17	28 20 24

COUNTY ROAD TRAFFIC—1924, 1925 and 1926—Continued

Traffic Census

AVERAGE DAILY

Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
		Ontario	Foreign					
LANARK COUNTY—Continued								
Lanark 3a—Almonte-Carp Rd., at Almonte-West Huntley Rd.	S. 1926	369	4	13		321	707	1,124
Lanark 3b—Almonte-West Huntley Rd., at Almonte-Carp Rd.	S. 1926	45		3		23	71	95
Lanark 4a—West Port Rd., at Darcyville Rd.	S. 1926	35	4			11	50	135
Township Roads—								
Lanark 1b—West Huntley Rd., at Townline Rd., between Huntley and Ramsay townships.	S. 1925	27		1		9	37	67
	A. 1925	12				7	19	30
	S. 1926	14				9	23	28
Lanark 2—Calabogie Rd., at White.	S. 1926	21	3	1		9	34	53
Lanark 4b—Darcyville Rd., at Westport Rd.	S. 1926	54	2			15	71	120
Lanark 15-7—Smith's Falls—Carleton Place Highway, at junction of the Ottawa-Kingston Highway.	S. 1926	282	10	15		47	354	523
LEEDS COUNTY:								
Leeds 1a—Athens-Brockville Rd., at Forthton (Athens-Forthton traffic).	S. 1924	84	11	10		13	118	173
	A. 1924	76	5	9		20	110	147
	S. 1925	59	14	7		6	86	120
	A. 1925	40	2	10		7	69	88
	S. 1926	92	20	17		8	137	191
Leeds 1b—Athens-Brockville Rd., at Forthton (Brockville-Smith Falls traffic).	S. 1924	44	5	25		11	85	95
	A. 1924	42		22		12	76	99
	S. 1925	59	8	30	1	8	106	130
	A. 1925	44	1	24		9	78	112
	S. 1926	61	13	28		4	106	152
Leeds 2a—Phillipsville Rd., at Toledo	S. 1925	57		4		54	115	159
	A. 1925	40		4		51	95	138
	S. 1926	80		7		50	137	204
Leeds 2b—Smith Falls-Brockville Rd., at Toledo	S. 1925	132	8	13		72	225	328
	A. 1925	107	1	11		77	196	263
	S. 1926	191	9	15		74	289	354

Leeds 2c—County Rd. No. 29 at Toledo.....	S. 1925	50	2	3	.....	22	77	116
	A. 1925	34	.....	4	.....	22	60	101
	S. 1926	67	3	5	.....	22	101	148
15-2a—Gananoque Rd., at Seeley's Bay.....	S. 1924	71	11	3	.....	16	101	146
	A. 1924	52	.....	1	.....	16	69	101
	S. 1925	80	17	4	2	12	115	208
	A. 1925	31	.....	2	.....	8	41	68
15-3a—Rideau Ferry Rd., at Lombardy.....	S. 1926	137	23	5	1	11	177	279
	S. 1924	142	.....	6	.....	27	175	207
	A. 1924	85	2	5	.....	41	133	172
	S. 1925	112	39	6	.....	23	180	267
	A. 1925	52	2	3	.....	22	79	115
	S. 1926	148	18	5	.....	28	199	218
2-30a—Lynn Rd., west of Brockville at provincial high- way.....	S. 1924	107	.....	9	.....	38	154	174
	A. 1924	95	4	11	.....	41	151	199
	S. 1925	92	16	15	1	31	155	179
	A. 1925	138	16	24	4	210	393	28
2-20 ¹ ₂ —Athens Rd., at Mallorytown.....	S. 1926	94	7	17	1	21	140	172
	S. 1925	51	4	9	.....	27	91	115
	A. 1925	2	.....	.....	.....	2	4	6
	S. 1926	55	10	3	.....	32	100	117
COUNTIES OF LENNOX AND ADDINGTON: County Roads— Lennox and Addington 1a—Napanee Rd., at Adolphus- town.....	S. 1924	61	4	5	.....	22	92	135
	A. 1924	36	.....	4	.....	21	61	77
	S. 1925	49	5	2	.....	15	71	114
	A. 1925	49	.....	7	.....	16	72	140
Lennox and Addington 1b—Bath Rd., at Adolphustown..	S. 1926	77	4	4	.....	18	103	139
	S. 1924	37	2	6	.....	16	61	105
	A. 1924	43	2	5	.....	31	81	103
	S. 1925	37	3	.....	.....	11	53	92
	A. 1925	53	.....	11	.....	16	80	126
Lennox and Addington 3a—County Rd. No. 4, at Milsap	S. 1926	85	7	7	.....	22	121	187
Lennox and Addington 3b—County Rd. No. 12, at Milsap	S. 1926	43	.....	2	.....	19	64	86
	S. 1926	54	2	4	1	7	68	112
Township Roads— Lennox and Addington 2—At Stella, on Amherst Island.	S. 1924	18	.....	1	.....	81	100	119
	A. 1924	17	.....	.....	.....	113	130	175
	S. 1925	21	1	.....	.....	74	96	110
	A. 1925	13	.....	.....	.....	64	77	109
	S. 1926	31	.....	2	.....	66	99	130

A. 1925 S. 1926	102 Not taken	1	19	27	149	187
Lincoln 3b—Smithville-Grimsby Rd., at junction of Smithville-Hamilton Rd.....	182 76 1,040	7 2 33	25 14 138	23 14 188	237 106 1,399	293 149 1,802
Lincoln 4a—County Rd. No. 5e, in the Village of Camp- den.....	Lincoln 4a 57 85	and 4b were 1 4	combined 18 18	is shown 49 35	under 125 142	Lin. 4b. 173 169
Lincoln 4b—County Rd. No. 11n, in the Village of Camp- den.....	81 17 39	3 1 2	12 7 12	28 23 18	124 48 71	151 75 85
Lincoln 5a—County Rd. No. 6e, at junction of County Rd. No. 12n.....	This was taken 16 29	at a wrong	location 3 3	and result 19 7	is shown 38 39	under Lin. 65 57
Lincoln 5b—County Rd. No. 12n, at junction of County Rd. No. 6e.....	Not taken 10 25	..... ..... .....	2 2 3	11 3 18	23 30 84	44 44 95
Lincoln—Intersection of Road No. 20 and the road to Silverdale (combined traffic).....	61	2	3	18	84	95
MIDDLESEX COUNTY:						
Middlesex 1a—Sarnia gravel rd. at Poplar Hill.....	803 97 306	13 100 588	33 25 23	18 25 19	869 248 939	1,151 469 1,225
Middlesex 1b—Poplar Hill-Delaware Rd. at Poplar Hill.....	171 294 232	80 787 21	32 21 17	13 8 26	298 1,113 296	1,225 391 508
Gloucester-Alvinston Rd., concessions 12 and 13, Ekfrid Township.....	116 218 139 155	1 19 3 23	16 15 29 12	42 22 18 11	175 274 189 201	218 354 304 238
Kirkwood Rd. at concessions 12 and 13.....	106 78 53	..... 1	6 5 3	26 18 12	138 102 68	274 148 162
Ekfrid Town hip.....	31	.....	2	10	43	53
Middlesex 2a—Townline Rd., between West Williams and McGillivray townships at concession 21, lots 25 and 26.....	73 38 58	7 11	5 3 5	30 28 30	115 69 104	144 130 129

COUNTY ROAD TRAFFIC—1924, 1925 and 1926—Continued

Traffic Census

DAILY AVERAGE

Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
		Ontario	Foreign					
MIDDLESEX COUNTY—Continued								
Middlesex 2b—Twenty-first concession rd., at lots 25 and 26.....	S. 1925	38	3	3	.....	22	66	104
	A. 1925	23	.....	1	.....	22	46	98
	S. 1926	41	7	3	.....	22	78	98
Middlesex 3a—London-Dorchester Rd. at Nilestown....	S. 1924	498	49	62	.....	27	631	932
	A. 1924	291	7	53	.....	23	374	435
	S. 1925	329	26	.....	.....	15	421	675
	A. 1925	204	.....	35	.....	15	254	288
	S. 1926	209	13	23	.....	8	253	308
Middlesex 3b—Nilestown-Belmont Rd., at Nilestown....	S. 1924	200	4	22	.....	17	243	357
	A. 1924	140	1	23	.....	22	186	224
	S. 1925	177	7	32	.....	12	228	328
	A. 1925	128	.....	23	.....	9	160	206
	S. 1926	161	8	20	.....	10	199	238*
	A. 1924	261	12	21	.....	75	369	433*
2-6a—County Road at Wardsville.....	A. 1924	214	9	20	.....	81	324	431
	S. 1925	208	18	21	.....	50	297	355
	A. 1925	213	14	20	.....	52	299	401
	S. 1926	Under construction		.....	.....	.....	.....	.....
	S. 1925	89	4	15	.....	23	131	141
2-7a—Strathroy Road at Christina.....	A. 1925	64	1	9	.....	17	91	120
	S. 1926	78	6	6	.....	14	104	120
2-9a—Whitton Road at Provincial Highway.....	S. 1924	227	.....	10	.....	7	244	318
	A. 1924	163	3	9	.....	5	180	217
	S. 1925	138	13	16	.....	6	173	242
	A. 1925	108	3	20	.....	7	139	176
	S. 1926	134	10	19	1	7	165	194
	A. 1924	327	223	19	2	10	581	833
4-3a—County Road traffic north of London.....	A. 1924	122	5	18	.....	24	169	239
	S. 1925	980	489	62	6	23	1,560	2,613
	A. 1925	503	13	53	3	27	599	733
	S. 1926	168	21	19	.....	15	223	292

7-10c—Elginfield-Lucan Road at Elginfield.....	S. 1924 A. 1924 S. 1925 S. 1925 A. 1925 S. 1926 S. 1926 S. 1924 A. 1924 S. 1925 A. 1925 S. 1926	Not taken 202 217 133 402 59 37 54 39 50	4 23 9 32 1 2 4 7	17 15 2 25 5 3 2 2 6	2 1	38 16 21 17 31 26 94 19 12	263 272 167 478 96 68 75 60 75	374 409 203 608 145 107 82 98
NORFOLK COUNTY:								
County Roads—								
Norfolk 1a—Simcoe-Pt. Dover Rd., at Vittoria Rd.	S. 1924 A. 1924 S. 1925 A. 1925 S. 1926 S. 1924 S. 1924 A. 1924 S. 1925 A. 1925 S. 1926	1,220 375 875 355 1,055 515 151 397 214 450 329 164 304 146 513 160 110 174 199 179 197 154 208 193 133 161 193 421	109 9 44 2 66 45 5 16 2 28 18 9 1 29 7 1 2 8 1 10 8 1 11 3 115	122 58 61 34 75 47 18 35 20 40 37 21 46 26 60 17 16 30 27 8 2 16 1 41 10 5 10 9 14 44	19 7 4 6 1 1 7	73 59 20 13 15 49 22 15 11 10 60 67 71 70 56 43 29 30 67 78 71 321 75 67 75 44 29 33	1,543 501 1,000 404 1,218 680 196 463 247 364 444 262 431 243 659 227 156 236 301 324 282 323 321 257 326 281 188 210 251 620	2,610 648 1,680 510 1,648 1,014 258 551 661 730 269 601 359 887 268 194 291 324 323 345 363 399 362 281 219 292 308 804
Norfolk 1b—Vittoria Rd., at Simcoe-Pt. Dover Rd.	S. 1924 A. 1924 S. 1925 A. 1925 S. 1926 S. 1924 S. 1924 A. 1924 S. 1925 A. 1925 S. 1926	1,220 375 875 355 1,055 515 151 397 214 450 329 164 304 146 513 160 110 174 199 179 197 154 208 193 133 161 193 421	109 9 44 2 66 45 5 16 2 28 18 9 1 29 7 1 2 8 1 10 8 1 11 3 115	122 58 61 34 75 47 18 35 20 40 37 21 46 26 60 17 16 30 27 8 2 16 1 41 10 5 10 9 14 44	19 7 4 6 1 1 7	73 59 20 13 15 49 22 15 11 10 60 67 71 70 56 43 29 30 67 78 71 321 75 67 75 44 29 33	1,543 501 1,000 404 1,218 680 196 463 247 364 444 262 431 243 659 227 156 236 301 324 282 323 321 257 326 281 188 210 251 620	2,610 648 1,680 510 1,648 1,014 258 551 661 730 269 601 359 887 268 194 291 324 323 345 363 399 362 281 219 292 308 804
Norfolk 2—Simcoe-Brantford Rd., at concessions 6 and 7	S. 1924 A. 1924 S. 1925 A. 1925 S. 1926 S. 1924 S. 1924 A. 1924 S. 1925 A. 1925 S. 1926	1,220 375 875 355 1,055 515 151 397 214 450 329 164 304 146 513 160 110 174 199 179 197 154 208 193 133 161 193 421	109 9 44 2 66 45 5 16 2 28 18 9 1 29 7 1 2 8 1 10 8 1 11 3 115	122 58 61 34 75 47 18 35 20 40 37 21 46 26 60 17 16 30 27 8 2 16 1 41 10 5 10 9 14 44	19 7 4 6 1 1 7	73 59 20 13 15 49 22 15 11 10 60 67 71 70 56 43 29 30 67 78 71 321 75 67 75 44 29 33	1,543 501 1,000 404 1,218 680 196 463 247 364 444 262 431 243 659 227 156 236 301 324 282 323 321 257 326 281 188 210 251 620	2,610 648 1,680 510 1,648 1,014 258 551 661 730 269 601 359 887 268 194 291 324 323 345 363 399 362 281 219 292 308 804
Township Roads—								
Norfolk 3b—Teeterville Rd at Windham Centre.....	S. 1925 A. 1925 S. 1926	102 64 110	5 1	14 15 21	..... ..... .....	20 36 19	141 115 151	180 143 181

Ontario 1a—Scugog Rd., at junction of Port Perry-Nestle- ton Station Rd.....	S. 1925	181	12	5	14	212	344
	A. 1925	103	.....	8	18	129	901
	S. 1926	314	13	12	10	349	440
		Not taken					
Ontario 1b—Port Perry-Nestleton Rd., at junction of Scugog Rd.....	S. 1924	174	6	15	25	220	364
	A. 1925	66	.....	12	35	113	150
	S. 1926	319	5	24	36	384	584
Ontario 2—County Road No. 49.....	S. 1925	152	.....	15	15	182	324
	A. 1925	41	.....	4	13	58	107
	S. 1926	192	5	14	16	227	392
Ontario 2a—County Road No. 17 and 24.....	S. 1926	226	6	5	9	247	437
		276	1	6	30	313	487
OXFORD COUNTY:							
County Roads—							
Oxford 1a—Ingersoll-Tillsonburg Rd. at Salford.....	S. 1924	273	18	36	98	429	564
	A. 1924	201	13	21	69	308	341
	S. 1925	313	26	42	83	467	619
Oxford 1b—Salford-Burgessville Rd., at Salford.....	A. 1925	246	15	29	80	374	510
	S. 1926	358	35	43	76	517	634
Oxford 2b—Embro-Beachville Rd., at junction of County Road No. 19.....	S. 1924	55	2	7	53	117	137
	A. 1924	57	3	5	37	102	133
	S. 1925	56	3	7	50	116	153
Oxford 3a—Harrington Rd. at junction of Embro Road.....	A. 1925	59	8	5	52	124	168
	S. 1926	71	6	14	43	134	166
Oxford 3b—Embro Rd., at junction of Harrington Rd.....	S. 1924	146	10	16	16	188	249
	A. 1924	111	2	14	16	143	175
	S. 1925	123	6	13	13	155	183
2-11a—Burford Rd. at Eastwood.....	A. 1925	59	.....	6	7	72	92
	S. 1926	132	5	14	14	166	192
	S. 1925	107	6	8	21	142	170
	A. 1925	104	.....	9	23	137	201
	S. 1926	118	3	14	16	151	183
	A. 1925	105	6	8	17	147	219
	S. 1926	139	4	15	23	137	193
	A. 1925	390	.....	8	17	174	204
	S. 1924	267	210	19	15	634	802
	A. 1925	46	282	20	8	577	725
	S. 1926	110	2	9	12	69	80

COUNTY ROAD TRAFFIC—1924, 1925 and 1926—Continued

Traffic Census
DAILY AVERAGE

Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
		Ontario	Foreign					
OXFORD COUNTY—Continued Township Roads— Oxford 2a—Embro-Beachvil'e Rd. at County Road No. 19.....	S. 1924 A. 1924 S. 1925 A. 1925 S. 1926	164 112 149 69 148	..... 2 5 5	12 14 12 8 18	..... ..... ..... ..... .....	20 9 13 7 13	196 137 179 84 184	270 149 276 114 213
PETERBOROUGH COUNTY: Peterborough 1a—Chemong Rd., north of Lindsay Rd....	S. 1924 A. 1924 S. 1925 A. 1925 S. 1926	671 176 670 143 521	..... 2 43 38	31 36 57 30 38	8 15 13	27 28 21 18 15	737 242 806 191 625	1,065 348 1,103 296 851
Peterborough 1b—Lindsay Rd., west of Chemong Rd....	S. 1924 A. 1924 S. 1925 A. 1925 S. 1926	175 120 201 108 228	..... ..... 10 27	10 17 19 17 24	..... ..... ..... ..... .....	5 7 5 5 3	190 144 234 130 282	326 199 411 204 430
Peterborough 1c—Communication Rd., south of Chemong Rd.....	S. 1924 A. 1924 S. 1925 A. 1925 S. 1926	846 296 870 251 748	..... 2 53 65	41 53 76 47 62	9 15 13	31 35 26 23 18	927 386 1,040 321 906	1,391 547 1,514 500 1,281
Peterborough 2a—Block Road at Norwood Road.....	S. 1924 A. 1924 S. 1925 A. 1925 S. 1926	141 124 28 19 19	4 2	17 23 4 3 3	1	10 11 7 5 2	172 161 39 27 24	229 212 51 42 37
Peterborough 2b—Norwood Rd. at Block Rd.	S. 1924 A. 1924 S. 1925 A. 1925 S. 1926	147 122 188 125 228	2 2 9 11	17 23 23 23 24	..... ..... 1 1	10 10 3 7 5	176 157 224 269	226 239 296 222 362

S.	1926	30	1	4		3	38	57
Peterborough 2c—Keene Rd., at intersection of Norwood and Block Roads.....	S. 1926	30						
12a-2a—Junction of Provincial Highway No. 12a and County Road at Concessions 7 and 8, Monaghan Township, county road traffic.....	S. 1924	31		7		11	49	62
	A. 1924	13		3		10	26	37
	S. 1925	13		1		8	22	31
	A. 1925	4		1		7	12	15
	S. 1926	21	1	3		12	37	45
PRESOTT COUNTY:								
17-2a—Junction of Provincial Highway No. 17 and road one mile west of Alfred.....	S. 1925	47	7	1	8	127	189	254
	A. 1925	33	1	2	4	60	100	145
	S. 1926	59	5	8	3	89	164	216
PRINCE EDWARD COUNTY:								
14-1a—Wellington Rd., at Bloomfield.....	S. 1924	244	6	11		41	302	377
	A. 1924	199	4	22	1	54	280	354
	S. 1925	323	11	31	1	59	425	590
	A. 1925	203		23	3	56	285	333
	S. 1926	357	18	23		77	475	655
14-2a—Carrying Place Rd., at Rossmore.....	S. 1925	238	15	42		45	340	549
	A. 1925	80	1	19		33	133	198
	S. 1926	167	5	20		32	224	327
Prince Edward 1a—High Shore Rd., at junction of Demoresville Rd.....	S. 1926	90	5	5		18	118	176
Prince Edward 1b—Demoresville Rd., at junction of High Shore Rd.....	S. 1926	167	4	26		40	245	301
PEEL COUNTY:								
Peel 1—Bellfountain-Cheltenham Rd. at Belfountain.....	S. 1924	246		7		80	333	542
	A. 1924	74	2	4		63	143	170
	S. 1925	100	1	3		23	127	297
	A. 1925	38		3		31	72	158
	S. 1926	279	3	4		60	346	583
PERTH COUNTY:								
Perth 1—Mitchell-Listowel Rd. at Bornholm.....	S. 1924	362		18		80	460	662
	A. 1924	189	3	12		88	292	346
	S. 1925	230	17	15		47	309	503
	A. 1925	202		14		99	315	295
	S. 1926	289	12	20		44	365	456
7-7a—Tavistock Rd. at Shakespeare.....	S. 1924	282	5	14		19	321	526
	A. 1924	174		59		67	300	370
	S. 1925	245	6	14		19	284	484
	A. 1925	190	1	20		42	253	407
	S. 1926	310	5	35		21	371	426

	S. 1925	70	2	6	16	94	130
17-7a—Cobden Rd. at Concessions 1 and 2, Ross Township.....	S. 1925	70	2	6	16	94	130
	A. 1925	36	.....	2	10	48	60
	S. 1926	58	1	4	11	74	109
	S. 1924	167	.....	12	92	271	305
	A. 1924	124	2	7	83	216	247
	S. 1925	205	7	11	84	312	334
	A. 1925	98	1	6	96	201	339
	S. 1926	219	7	14	77	317	353
RUSSELL COUNTY:							
Russell 1a—Town Line Rd. between Russell and Cumberland Townships.....	S. 1926	20	1	3	17	41	51
Russell 1b—Russell Rd. at junction of Town Line Rd.....	S. 1926	19	.....	4	25	49	80
SIMCOE COUNTY:							
County Roads—							
Simcoe 1a—Barrie-Elmhvale Rd. at Midhurst.....	S. 1924	158	.....	7	6	171	280
	A. 1924	56	.....	7	8	71	99
	S. 1925	170	7	10	6	193	360
	A. 1925	59	.....	7	7	73	111
	S. 1926	263	7	14	1	289	510
	S. 1924	262	5	11	16	294	440
	A. 1924	120	.....	11	21	152	213
Simcoe 1b—Minesing Rd. at Midhurst.....	S. 1925	241	10	14	16	281	483
	A. 1925	101	1	10	17	129	193
	S. 1926	398	12	16	12	438	715
	S. 1924	193	.....	3	15	211	318
	A. 1924	75	.....	4	15	94	110
	S. 1925	233	17	7	15	272	409
	A. 1925	146	1	4	22	364	604
	S. 1926	405	24	11	29	462	697
	S. 1924	293	.....	7	32	332	527
Simcoe 2b—Brentwood-Collingwood Rd. at Sunnydale.....	A. 1924	140	.....	7	46	193	234
	S. 1925	284	14	8	27	334	543
	A. 1925	171	1	6	39	217	261
	S. 1926	192	1	5	24	223	384
	S. 1924	217	11	9	28	265	397
	A. 1924	125	.....	8	28	161	213
	S. 1925	211	19	15	18	263	375
	A. 1925	127	.....	9	26	162	214
	S. 1926	424	56	14	20	518	754
	S. 1924	190	1	23	36	252	324
	A. 1924	147	.....	28	46	223	348
	S. 1925	216	8	29	33	287	368
	A. 1925	124	1	22	32	179	283
	S. 1926	267	7	30	3	339	555
11-5a—County Rd. at South Limits, Orillia.....							

COUNTY ROAD TRAFFIC—1924, 1925 and 1926—Continued

Traffic Census

DAILY AVERAGE

Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
		Ontario	Foreign					
SIMCOE COUNTY—Continued Township Road— 11-6a—Sparrow Lake Rd. at Toronto-Severn Highway...	S. 1924	131	2			4	137	192
	A. 1924	30		2		2	34	41
	S. 1925	98	9	2		1	110	223
	A. 1925	31		1		3	35	59
	S. 1926	143	15	8		1	167	266
VICTORIA COUNTY: County Roads— Victoria 1a—Omeme Rd., south of Lindsay at Cobourg Rd.....	S. 1924	518	6	30		90	644	922
	A. 1924	371		32		84	487	670
	S. 1925	541	14	37		60	652	986
	A. 1925	230	1	24		33	288	421
	S. 1926	448	11	32		32	523	704
Victoria 1b—Cobourg Rd., south of Lindsay at Omeme Rd.....	S. 1924	180	2	9		44	235	358
	A. 1924	148		16		40	204	275
	S. 1925	218	4	12		29	263	383
	A. 1925	145		18		30	193	282
	S. 1926	266	3	16	1	25	310	461
Victoria 2a—Bobcaygeon Rd. at King's Wharf Rd.....	S. 1924	50	2	4		20	76	149
	A. 1924	30		2		16	48	89
	S. 1925	377	11	29		62	479	607
	A. 1924	180		17		71	268	370
	S. 1925	377	13	21		43	454	648
Victoria 3a—Bobcaygeon Rd. at east limits of Lindsay. Moved three-quarter mile northerly owing to paving operations.	A. 1925	164		15		52	318	521
	S. 1926	339	25	20		33	417	546
	S. 1924	155	3	17		79	254	322
	A. 1924	116	3	9		101	229	368
	S. 1925	137	1	16		75	229	296
Victoria 3b—Downeyville Rd. at east limits of Lindsay.	A. 1925	100		12		97	209	258
	S. 1926	226	5	23		97	351	423

12-4a—Little Britain Rd. at western limits of Lindsay...	S. 1924	155	1	15	19	190	226
	A. 1924	90	1	14	15	120	166
	S. 1925	356	9	34	28	427	524
	A. 1925	281	1	27	36	345	468
	S. 1926	424	8	24	22	478	570
Township Roads—							
Victoria 2b—King's Wharf Rd. at Bobcaygeon Rd.	S. 1924	22	.....	2	18	42	62
	A. 1924	22	.....	1	14	37	58
WATERLOO COUNTY:							
County Roads—							
Waterloo 1a—Waterloo-Elmira Rd. at St. Clements Rd.	S. 1924	811	4	52	64	939	1,533
	A. 1924	539	1	59	73	680	895
	S. 1925	818	53	65	86	1,031	1,864
	A. 1925	262	3	30	41	344	558
	S. 1926	954	25	71	60	1,118	1,626
Waterloo 1b—St. Clements Rd. at Elmira Rd.	S. 1924	191	.....	to construction work.	.....	.....	.....
	A. 1924	328	25	20	43	254	428
	S. 1925	175	2	30	38	441	707
	A. 1925	352	7	18	57	252	349
	S. 1926	.....	.....	28	415	.....	564
Waterloo 2a—West Montrose-Winterbourne Rd., lots 1, 74, 75, Woolwich Township.	S. 1924	92	.....	6	31	130	214
	A. 1924	77	1	11	34	123	149
	S. 1925	105	2	12	40	161	195
	A. 1925	54	.....	1	37	101	151
	S. 1926	99	.....	10	129	240	305
7-5a—East of Kitchener, Preston-Conistogo Rd.	S. 1924	260	2	10	37	318	492
	A. 1924	60	1	19	24	88	102
	S. 1925	160	19	4	38	241	263
	A. 1925	104	1	24	52	177	272
	S. 1926	151	2	20	34	209	237
7-6a—Wellesley Rd. at Baden.	S. 1924	70	2	22	104	104	160
	A. 1924	56	.....	11	21	85	107
	S. 1925	60	3	6	15	88	131
	A. 1925	9	.....	10	26	34	.....
	S. 1926	144	4	2	15	183	241
Township Roads—							
Waterloo 2b—Guelph-West Montrose Rd. at lots 1, 74, 75, Woolwich Township.	S. 1924	100	.....	9	30	139	225
	A. 1924	76	.....	11	32	119	160
	S. 1925	102	1	13	29	146	194
	A. 1925	62	.....	11	38	111	168
	S. 1926	100	2	10	120	232	308

COUNTY ROAD TRAFFIC—1924, 1925 and 1926—Continued

Traffic Census
DAILY AVERAGE

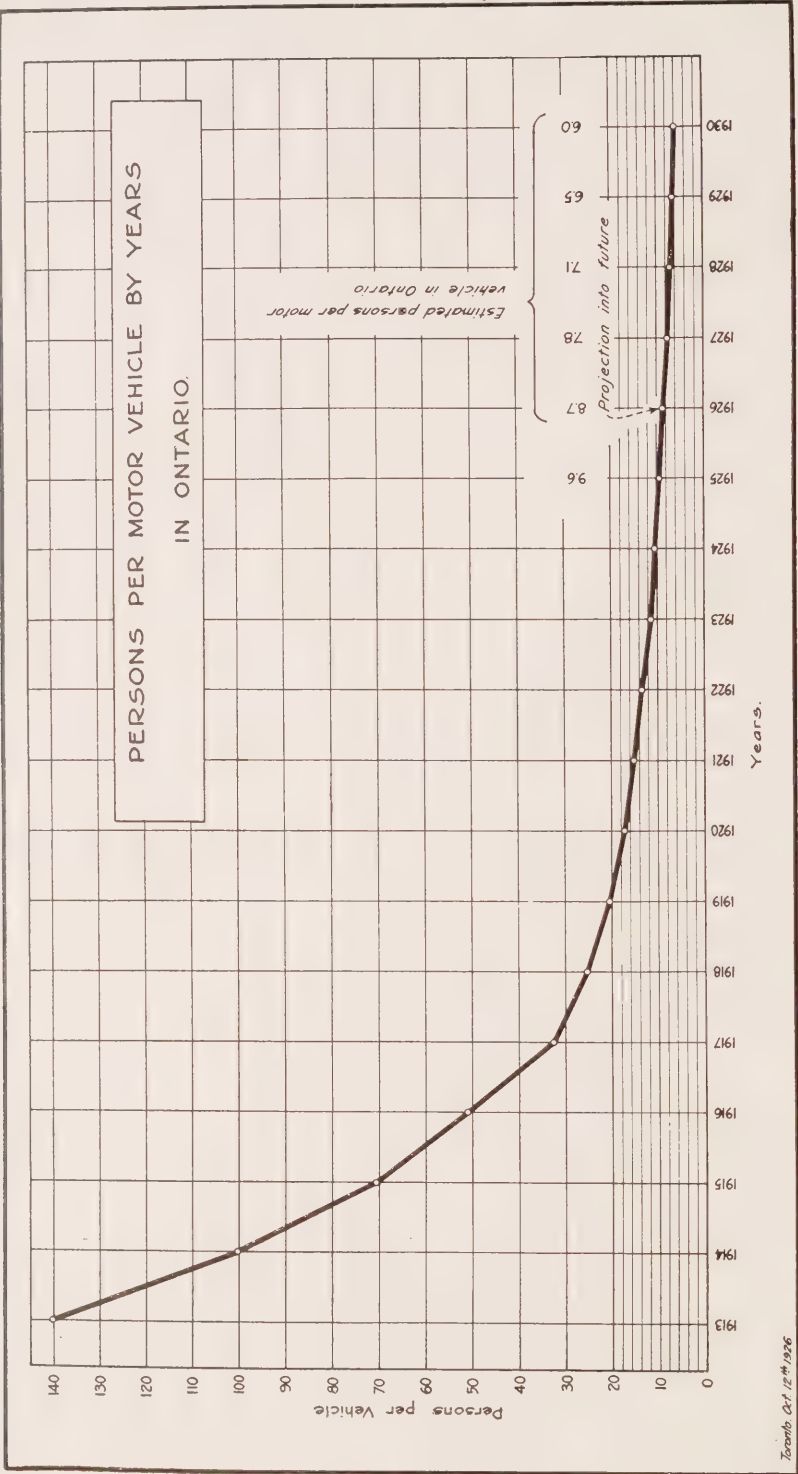
Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
		Ontario	Foreign					
WELLAND COUNTY: Welland 1a—Garrison Rd. at Chippewa Rd.....	S. 1924	2,179	.....	52	32	12	2,275	4,057
	A. 1924	395	239	44	24	72	774	1,479
	S. 1925	506	1,892	88	31	15	2,532	3,055
	A. 1925	703	305	53	23	29	1,113	1,599
	S. 1926	1,037	2,008	106	22	14	3,187	4,178
Welland 1b—Ridegeway Rd. at Garrison Rd.....	S. 1924	1,965	.....	59	33	22	2,079	3,417
	A. 1924	347	149	45	22	44	607	976
	S. 1925	500	1,644	98	32	19	2,293	2,461
	A. 1925	627	239	60	23	46	995	1,329
	S. 1926	975	1,607	106	22	14	2,724	3,126
Welland 1c—Chippewa Rd. at Garrison Rd.....	S. 1924	493	.....	28	4	23	548	1,080
	A. 1924	200	14	31	.....	35	280	363
	S. 1925	275	211	41	3	16	546	691
	A. 1925	431	94	41	.....	37	603	645
	S. 1926	570	526	57	3	13	1,169	1,813
Welland 2—Garrison Rd. at lot 1, concession 1, Wainfleet Township.....	S. 1924	591	162	69	1	42	885	1,607
	A. 1924	387	45	72	.....	58	562	957
	S. 1925	854	348	132	1	110	1,445	2,354
	A. 1925	355	39	108	2	63	567	692
	S. 1926	907	384	151	2	45	1,489	2,052
3-14a—County Rd., lots 39-40, Wainfleet Township, at Provincial Highway.....	S. 1924	163	26	19	.....	7	215	367
	A. 1924	74	8	15	.....	10	107	152
	S. 1925	107	7	18	.....	5	137	249
	A. 1925	98	3	14	.....	6	121	154
	S. 1926	578	185	53	3	18	837	1,525
3-15a—Montrose Rd. at Lundy's Lane.....	S. 1924	238	67	42	.....	18	365	663
	A. 1924	280	36	43	.....	28	387	543
	S. 1925	364	71	49	3	31	518	693
	A. 1925	262	24	58	1	22	367	425
	S. 1926	299	59	42	.....	18	418	722

8-4a—Thorold Rd. at South End Corner.....	S. 1924	562	55	92	4	33	746	1,078
	A. 1924	364	50	76		26	516	655
	S. 1925	588	100	123	1	16	828	977
	A. 1925	321	112	98	1	19	551	618
	S. 1926	364	82	86	1	10	543	613
8-1b—Portage Rd. at Southend Corner.....	S. 1924	588	54	177	5	24	848	1,128
	A. 1924	1,290	319	289	47	48	1,993	3,357
	S. 1925	559	194	129	1	23	906	1,170
	A. 1925	209	45	84	1	15	354	401
	S. 1926	468	133	109		19	729	1,022
Niagara Boulevard, near Bridgeburg.....	S. 1926	487	518	39	4	6	1,054	1,840
WELLINGTON COUNTY:								
County Roads—								
Wellington 1b—Elora Rd. at Alma.....	S. 1924	373	9	11		58	451	762
	A. 1924	253		21		87	361	412
	S. 1925	360	19	26		91	496	713
	A. 1925	194	4	10		82	290	338
	S. 1926	591	29	36		81	737	1,737
Wellington 1c—Elmira Rd. at Alma.....	Not taken							
	A. 1924	74		8		32	114	136
	S. 1925	150	7	10		28	195	287
	A. 1925	78	1	6		29	114	185
	S. 1926	208	8	16		20	252	390
9-2a—Palmerston Rd. at Teviotdale.....	S. 1924	61		3		11	75	107
	A. 1924	34		3		5	42	52
	S. 1925	52	1	4		6	63	103
	A. 1925	41		5		13	59	65
	S. 1926	103	4	7		12	126	173
	S. 1924	285	9	8		15	317	481
	A. 1924	90	2	7		7	105	134
	S. 1925	205	10	9		6	230	406
	A. 1925	61	1	5		8	75	170
	S. 1926	256	16	12		5	289	491
	S. 1924	150	4	8		29	191	289
	A. 1924	85		8		36	129	166
	S. 1925	128	6	14		26	174	242
	A. 1925	71	1	8		41	121	172
	S. 1926	136	5	13		28	182	245
	S. 1924	103		3	92	92	198	313
	A. 1924	70	1	2		100	173	224
	S. 1925	101	1	4		72	178	147
	A. 1925	32		3		59	94	125
	S. 1926	244	3	3		72	322	489
9-2b—Elora Rd. at Teviotdale.....								
9-3a—Clifford-Hanover Rd. at Clifford Village.....								
6-5a—Arthur-Orangeville Rd. at Arthur.....								

COUNTY ROAD TRAFFIC—1924, 1925 and 1926—Continued
Traffic Census
DAILY AVERAGE

Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
		Ontario	Foreign					
WELLINGTON COUNTY—Continued Township Road— Wellington 1a—Archibald and Lobey sideroad at Alma	S. 1924	23	.....	2	.....	25	50	73
	A. 1924	10	.....	1	.....	21	32	42
	S. 1925	19	.....	3	.....	18	40	64
	A. 1925	22	.....	.....	.....	23	45	77
	S. 1926	72	1	9	.....	18	100	141
WENTWORTH COUNTY: Wentworth 1a—Barton Street at Parkdale Avenue Wentworth 1b—Parkdale Avenue at Barton Street 5-6a—County Rd. at Concessions 5 and 6, Glanford Township	S. 1924	836	5	106	.....	90	1,037	1,292
	S. 1924	458	2	44	.....	49	533	660
	A. 1924	92	1	7	.....	28	128	181
	S. 1926	95	1	14	.....	15	125	147
	S. 1924	113	2	11	.....	24	150	237
6-2a—Brock Rd. at Freulton	A. 1924	103	.....	10	.....	28	141	178
	S. 1925	102	4	15	.....	15	136	162
	A. 1925	86	.....	19	.....	29	134	183
	S. 1926	131	2	15	.....	19	167	230
	S. 1924	234	5	17	.....	17	273	415
6-1a—Dundas St. west of Clappison's Corners	A. 1924	245	2	18	.....	21	286	365
	S. 1925	274	10	26	.....	10	320	428
	A. 1925	254	3	53	.....	14	324	374
	S. 1926	442	19	40	.....	7	508	678
	S. 1924	107	.....	12	.....	5	124	149
8-5a—Old Stoney Creek Rd. at Hamilton-Queenston Highway	A. 1924	69	.....	6	.....	5	80	94
	S. 1925	147	15	30	1	7	200	290
	A. 1925	98	4	38	2	8	150	176
	S. 1926	259	15	49	.....	12	335	486
	S. 1924	294	4	45	.....	48	391	454
8-6a—Brock Rd. at Bullock's Corners	A. 1924	276	3	61	.....	60	400	442
	S. 1925	375	10	62	.....	33	480	582
	A. 1925	255	2	59	.....	38	354	429
	S. 1926	326	7	54	.....	37	424	567

2-14a—Dundas Rd. at Binkley's Corners.....	S. 1925	2,201	220	327	133	59	2,940	3,647
	A. 1925	1,529	26	212	106	37	1,910	2,547
	S. 1926	2,391	207	356	139	47	3,140	3,956
YORK COUNTY:								
York 1a—Sutton Rd. at Sharon.....	S. 1924	1,209		51		35	1,295	2,579
	A. 1924	364	1	39		36	440	650
	S. 1925	965	33	45		27	1,070	1,687
	A. 1925	288		30		26	344	483
	S. 1926	1,252	22	57	1	17	1,349	3,236
York 1b—Mount Albert Rd. at Sharon.....	S. 1924	113		12		16	141	218
	A. 1924	104		14		18	136	182
	S. 1925	134	1	11		12	158	232
	A. 1925	128		10		16	154	249
	S. 1926	145	1	12		8	166	224
York 2 West Rd. at Eglinton Avenue.....	A. 1925	1,744	3	533	44	99	2,423	2,966
	S. 1926	3,021	18	716	5	120	3,880	4,506
York 3—Vaughan Rd. at Eglinton Avenue.....	A. 1925	849	1	367	6	118	1,341	2,659
	S. 1926	1,775	9	345	5	77	2,211	2,617
11-0b—West from Yonge Street at Lansing Corner.....	S. 1925	106	2	32		15	155	281
	A. 1925	139	2	42		38	221	457
	S. 1926	130	1	14		9	154	230
11-0c—East from Yonge Street at Lansing Corner.....	S. 1925	311	8	92		23	434	652
	A. 1925	531	1	166		38	736	1,646
	S. 1926	512	6	56		16	590	853
11-1a—Langstaff Rd. at Langstaff Corner.....	S. 1924	490	6	57	2	36	591	809
	A. 1924	414	4	125		59	602	937
	S. 1925	400	10	55		18	481	859
	A. 1925	268	1	62	1	24	355	479
	S. 1926	781	10	77		32	902	1,792
5-1a—Dundas Street at Islington.....	S. 1924	1,701		215	61	26	2,003	2,738
	A. 1924	1,206	10	286	52	36	1,590	2,610
	S. 1925	1,039	56	208	76	25	1,404	1,371
	A. 1925	755	7	189	94	28	1,073	1,301
	S. 1926	1,545	43	213	82	18	1,901	2,513
2-18a—Markham Rd. at Danforth Avenue.....	S. 1924	1,760	7	298	82	78	2,220	2,810
	A. 1924	1,395	4	400	80	96	1,975	2,406
	S. 1925	1,260	50	309	74	69	1,762	2,022
	A. 1925	2,391	55	621	40	247	3,354	4,168
	S. 1926	2,077	66	365	80	73	2,661	3,629
2-18 1/2a—Old Kingston Rd. at Danforth Avenue.....	A. 1925	1,499	30	267	21	19	1,836	2,075
	S. 1926	2,618	373	275	36	12	3,314	4,396



Report of Motor Vehicles Branch

For years 1923, 1924 and 1925

J. B. BICKELL, Registrar of Motor Vehicles

Registrations—Motor Vehicles, etc.

The motor vehicle registrations have shown a considerable increase and the passenger cars now number 303,736, commercial vehicles 34,690 and motorcycles 3,748, the last named decreasing in number each year. Statistics of the motor vehicle registrations for the calendar years 1923, 1924 and 1925, arranged according to passenger cars, commercial vehicles, motorcycles, trailers, passenger car dealers, commercial vehicle dealers, chauffeurs and garages will be found in Appendix No. 25 to 28.

Issuers of Motor Vehicle Permits.

Agents of the Department for issuing motor vehicle permits were appointed at 89 points in the Province and with the exception of three gave very satisfactory service. A new system of banking was inaugurated whereby the fees collected by the Agent are deposited in a local bank to the credit of the Department. Checks on these accounts are made payable to the Provincial Treasurer only. The system has enabled the Department to more promptly deposit with the Provincial Treasury Department the revenue collected by the Department's out-of-town agents.

Suspension or Cancellation of Motor Vehicle Permits

During 1925 there were recorded 146 convictions of persons operating motor vehicles while intoxicated. Pursuant to Section 46 of the Highway Traffic Act the permits issued for the cars being operated were suspended, if the offence was committed by the owner. If the offender was a chauffeur his license was suspended. If the offender was not the owner of a vehicle or a registered chauffeur, he was prohibited from driving any motor vehicle for a period. These suspensions or prohibitions vary in length of time according to the seriousness of the offence—from three months to one year. Three of those convicted of this offence were American tourists.

There were a total of 157 permits or licenses suspended by convicting Magistrates for such offences as reckless driving, speeding, failure to return to scene of accident and driving while permit or license was suspended.

Garages

In addition to the licensing of garages the Department has employed two Inspectors to supervise these places of business. The duties of these Inspectors briefly are to check up the registration numbers on cars found in, the employment of non-licensed chauffeurs and to assist in the location of stolen cars. In addition to this work the Inspectors visit the Police Departments of the various cities and towns pointing out the condition of affairs found in the garages and suggesting methods of checking, etc.

Chauffeur Examiners

During the year 1925 the examiners of applicants for chauffeur licenses were visited by specially appointed Inspectors and the reports of these Inspectors showed that with but very few exceptions the examiners already appointed are well qualified for their work.

Re Public Vehicles

The licensing and regulating of the public passenger vehicle has during the past year occupied a prominent place in the work of the Branch. The Public Vehicles Act and the Regulations passed thereunder are now being enforced on all the Highways under the jurisdiction of the Department or any township or county council or any suburban or other commission. Operators of these vehicles realizing the value of the regulations as preventative of undue competition have given the Department very little trouble. With but one or two exceptions we have enjoyed the whole hearted co-operation of these operators. While there is the expected claim that the fees charged by the Department are exorbitant the operators complaining are in the minority and usually are those who through lack of patronage or lack of ability are not qualified to manage a bus route and should be in some other line of business. As previously stated there has been real co-operation between the operators and the Department in the matter of time tables, tariff of tolls and in some cases in improving equipment and service.

Applications from prospective operators are becoming more numerous and especially applications for permission to operate on routes which have proven their worth. Following the policy of the Department as adopted when these operators were first licensed, such applications are definitely rejected. If I may be permitted to make an observation I would say that generally speaking competition does not tend to improve the service to the public—opposition seems to create a disregard of time tables and opposing operators appear to think more of securing the business of the other rather than of retaining and increasing their own by a regular and dependable service.

There has been marked improvement in the type of vehicle or bus being used in this service and in the regular operation of the various routes since the Department assumed control under the Public Vehicles Act.

Traffic Officers

The force of Highway Traffic Officers consisted in 1925 of 38 men and their work was I believe very effective. This force acting under instructions from the Registrar of Motor Vehicles is more of a preventative than a punitive force. The Officers have during the past year been even more liberal with their warnings than in previous years. The enforcement of the Headlight Regulations was given special attention and a decided improvement in driving conditions at night has been noted. No prosecutions were made for offences against the Headlight Regulations but we are planning to prosecute those who persist in operating with glaring head lights. The fact that accidents on our Provincial Highways have not increased to any great extent even in face of the enormous increase in local and tourist traffic and that complaints of excessive speeding are seldom received, speaks well for the efficiency of this force.

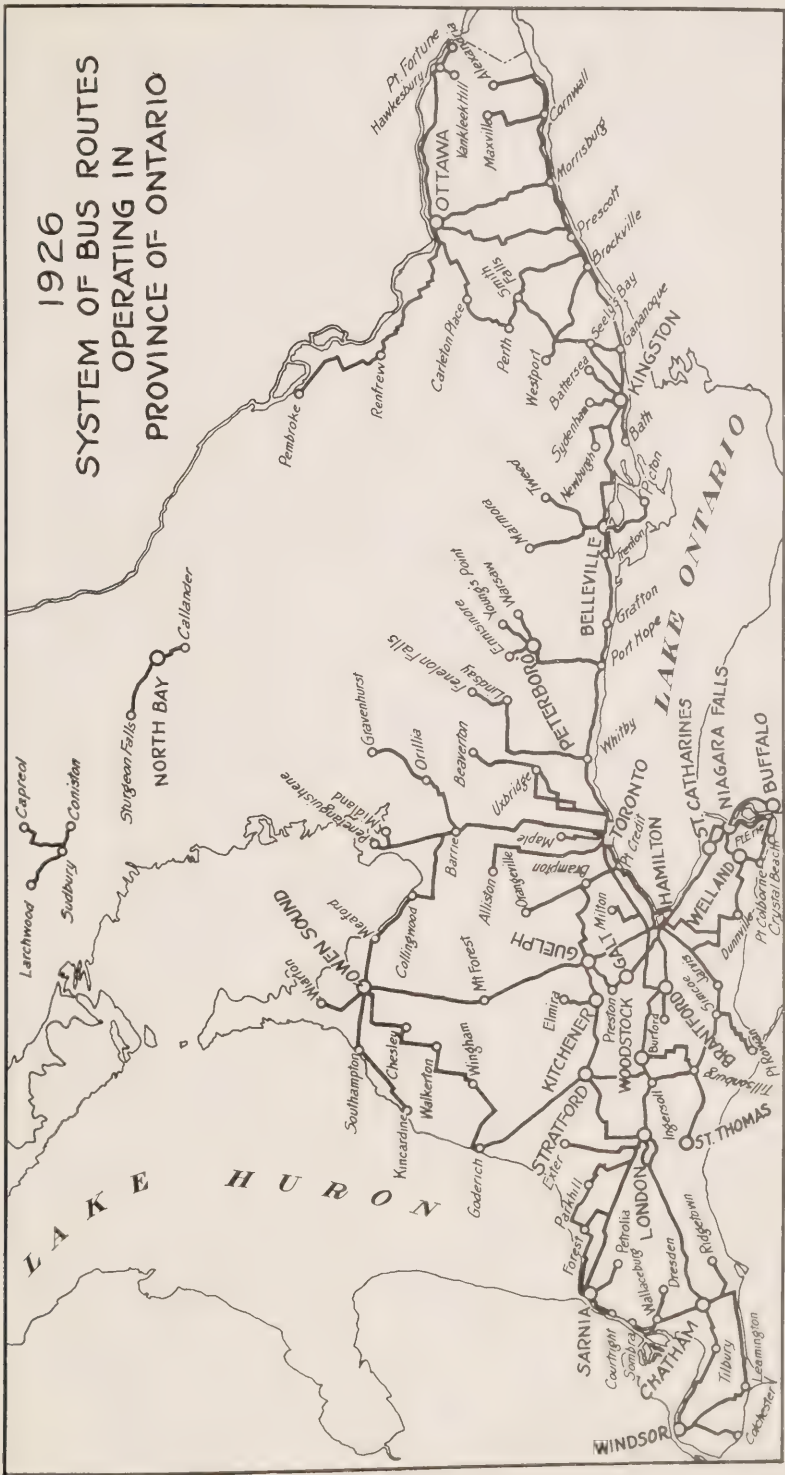
Eastern Conference

The Registrar of Motor Vehicles attended several Meetings of the Eastern Conference of Motor Vehicle Administrators, which is composed of the States of Pennsylvania, Connecticut, Delaware, District of Columbia, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, Vermont, Virginia, and the Provinces of Quebec and Ontario and was formed for the purpose of procuring, not only uniform laws and regulations respecting the operation of motor vehicles, but in so far as possible uniform methods of administering such laws and regulations. Such subjects as:

- (1) The compilation of accident statistics
- (2) Compulsory Automobile Insurance
- (3) Examination of automobile operators
- (4) Interchange of automobile licenses and permits
- (5) Load limits for trucks
- (6) Headlight testing and enforcement of law, etc.
- (7) Drive yourself Systems

and other less important subjects have been discussed to the mutual advantage of the various States and Provinces.

Revenue for the Fiscal Years	1924-1925	1923-1924	1922-1923
Automobile permits.....	\$4,441,348 02	\$3,969,341 91	\$3,596,097 35
Commercial permits.....	954,931 63	637,691 50	590,895 00
Trailer permits.....	6,188 60	4,735 44	3,521 15
Motorcycle permits.....	14,614 63	15,224 75	16,933 00
Automobile dealers' permits.....	41,147 84	38,075 65	35,804 50
Commercial dealers' permits.....	3,491 00	3,000 00	3,229 00
Motorcycle dealers' permits.....	73 00	48 00	79 00
Chauffeurs.....	41,057 80	36,137 62	31,526 00
Duplicate cards and badges.....	493 60	29 00	37 25
Non-professional certificates.....	23 00	24 00	26 00
Transfers.....	75,730 57	59,222 46	55,332 00
In transits.....	8,648 00	6,441 50	8,781 00
Garages.....	20,761 70	20,133 84	17,022 50
Certificates.....	18 12	18 50	14 00
Telephone commission.....	12 62	6 51	11 33
Incomplete applications.....	260 60	184 25	.....
Testing headlights.....	25 00	.....	.....
Lists.....	3,336 84	4,764 75	5,181 88
Fines.....	45,352 45	30,844 38	2,660 48
Public vehicles.....	50,918 83	10,837 78	.....
Balance due on 1923 permits.....	.....	10,406 59	121 03
G. S. McCrea cheque charged back.....	.....	1,641 45	.....
Overpaid by agents, 1924.....	.....	504 88	.....
Totals.....	\$5,708,433 85	\$4,849,314 76	\$4,367,272 47
Less—			
Commissions deducted by agents.....	\$69,132 35	\$63,967 60	\$59,160 65
Express charges paid by agents.....	71 78	34 26	36 46
Cheques charged back by Provincial Treasurer..	73 00	77 77	1,659 45
Balance due by agents.....	163 34	.....	10,406 59
Totals.....	\$69,440 47	\$64,079 63	\$71,263 16
Grand totals.....	\$5,638,993 38	\$4,785,235 13	\$4,296,009 32
Total fees collected by agents.....	\$4,437,850 75	\$3,769,927 25	\$3,465,909 75
Total commissions deducted by agents.....	69,132 25	63,967 60	59,160 65



**MOTOR VEHICLE REGISTRATIONS AND REVENUE FOR THE YEARS
1904-1925 INCLUSIVE**

Year	Passen- ger cars	Owned in Ontario	Others	Com- mercial vehicles	Motor- cycles	Cycles in Ontario	Others	Chauf- feurs	Revenue
1904	535								\$1,680 00
1905	553								1,142 00
1906	1,176	517	659						5,523 15
1907	1,530	550	980						8,098 50
1908	1,754	589	1,165						10,007 75
1909	2,452	1,020	1,432						12,418 75
1910	4,230	1,977	2,253						24,394 01
1911	11,339	7,338	4,001						50,831 22
1912	16,266	11,939	4,327		1,754	1,648	106	2,965	73,255 96
1913	23,700	17,750	5,950		2,900	2,650	250	3,514	105,558 95
1914	31,724	25,308	6,416		3,633	3,457	176	3,773	149,210 45
1915	42,346	36,661	5,685		4,174	3,844	330	5,322	334,759 78
1916	51,589	50,587	1,002	2,786	4,287			5,966	639,987 09
1917	78,861	78,475	386	4,929	5,180			8,214	930,753 00
1918	101,845	101,599	246	7,529	5,002			10,629	1,214,093 87
1919	127,860	127,512	348	11,428	5,516			15,400	1,580,146 61
1920	155,861	155,519	342	16,204	5,496			19,563	1,990,833 38
1921	181,978	181,686	292	19,554	4,989			21,808	2,945,360 36
1922	210,333	210,008	325	24,164	4,799			25,301	3,477,430 13
1923	245,815	245,435	380	28,612	4,325			27,033	4,296,009 32
1924	271,341	270,876	465	31,488	3,941			29,676	4,784,697 13
1925	303,736	303,216	520	34,690	3,748			33,740	5,638,993 45

**FEES COLLECTED FOR MOTOR VEHICLE PERMITS, ISSUED BY AGENTS DURING
THE FISCAL YEAR OCTOBER 31st, 1924, to NOVEMBER 1st, 1925**

Location	Amount of fees Collected	Commission
1. Toronto.....	\$498,126 75	\$4,446 10
2. Hamilton.....	353,065 00	5,277 50
3. London.....	246,109 00	3,993 25
4. Windsor.....	211,665 75	3,567 85
5. Ottawa.....	207,027 50	3,179 50
6. Woodbridge.....	33,868 50	527 50
7. Newmarket.....	36,040 50	613 50
8. Unionville.....	28,923 00	475 50
9. Brampton.....	35,892 00	587 25
10. Milton.....	19,722 50	338 75
11. St. Catharines.....	87,797 00	1,357 25
12. Welland.....	60,628 00	1,002 25
13. Fort Erie.....	32,470 00	468 50
14. Niagara Falls.....	69,479 25	1,023 75
15. Dunnville.....	33,382 00	570 25
16. Simcoe.....	50,865 00	838 00
17. Port Rowan.....	7,810 00	131 25
18. Brantford.....	86,798 00	1,399 00
19. Woodstock.....	92,339 50	1,551 75
20. Stratford.....	79,615 50	1,338 50
21. Kitchener.....	103,263 50	1,631 50
22. Galt.....	49,950 00	822 50
23. Guelph.....	64,727 50	1,063 75
24. St. Thomas.....	90,329 00	1,532 00
25. Chatham.....	138,896 50	2,377 75
26. Kingsville.....	42,528 50	719 75
27. Walkerville.....	66,826 50	975 25
28. Sarnia.....	81,303 00	1,370 00
29. Wingham.....	47,042 00	816 25
30. Goderich.....	29,156 00	498 50
31. Orangeville.....	38,005 50	658 50
32. Walkerton.....	22,653 00	383 00

Location	Amount of fees Collected	Commission
33. Kincardine.....	13,011 00	224 75
34. Wiarton.....	17,857 00	306 25
35. Meaford.....	15,562 50	272 25
36. Owen Sound.....	49,439 50	847 50
37. Hanover.....	34,326 00	595 25
38. Barrie.....	50,924 50	873 50
39. Orillia.....	27,070 50	453 75
40. Midland.....	22,893 50	386 00
41. Collingwood.....	23,699 00	397 50
42. Oshawa.....	70,522 00	1,373 15
43. Beaverton.....	19,086 00	328 50
44. Port Hope.....	17,470 50	296 75
45. Lindsay.....	50,033 50	860 25
46. Cobourg.....	24,898 50	413 75
47. Campbellford.....	30,511 00	523 00
48. Peterboro.....	69,794 00	1,167 50
49. Belleville.....	80,079 50	1,480 00
50. Tweed.....	12,582 00	220 00
51. Picton.....	30,426 50	504 75
52. Napanee.....	29,926 50	511 50
53. Kingston.....	60,480 00	987 00
54. Parham.....	7,268 00	131 50
55. Gananoque.....	18,783 50	319 75
56. Prescott.....	15,981 00	268 75
57. Brockville.....	33,068 50	520 00
58. Smith's Falls.....	33,795 00	580 50
59. Carleton Place.....	14,305 00	247 00
60. Pembroke.....	25,905 00	440 50
61. Arnprior.....	11,856 00	205 75
62. Renfrew.....	16,088 00	270 00
63. Kemptville.....	11,725 00	202 25
64. Winchester.....	25,667 50	440 00
65. Cornwall.....	38,405 00	647 50
66. Alexandria.....	12,237 00	213 00
67. Vankleek Hill.....	21,718 50	360 50
68. Gravenhurst.....	13,034 50	218 75
69. Gore Bay.....	5,389 00	95 75
70. Parry Sound.....	7,082 00	123 50
71. North Bay.....	21,459 00	354 00
72. Bruce Mines.....	4,761 00	80 75
73. Sault Ste. Marie.....	39,898 50	643 25
74. Cobalt.....	23,960 50	364 25
75. Timmins.....	13,227 00	202 75
76. Fort William.....	36,417 50	583 00
77. Port Arthur.....	27,299 50	448 00
78. Fort Francis.....	14,235 00	234 50
79. Kenora.....	3,664 00	62 50
80. Burk's Falls.....	10,897 50	191 00
81. Powassan.....	5,978 00	106 50
82. Sturgeon Falls.....	8,169 00	135 00
83. Espanola.....	4,854 00	81 50
84. Harriston.....	30,415 00	530 50
85. Thessalon.....	7,459 00	117 75
86. Bowmanville.....	14,630 00	249 00
87. Cochrane.....	3,193 00	55 25
88. Sudbury.....	28,696 00	462 00
89. Clinton.....	22,429 50	387 00
	<hr/>	<hr/>
	\$4,437,850 75	\$69,132 35

SUMMARY OF CONVICTIONS REGISTERED UNDER THE HIGHWAY TRAFFIC ACT 1925 (CALENDAR YEAR)

Section violated	Offence	Number of convictions
1. 5	No registration plates.....	197
2. 6	Defaced registration plates.....	87
3. 7 (1)	Improper registration plates.....	38
4. 7 (3)	Dirty registration plates.....	116
5. 10 (1)	No lights.....	525
6. 10 (2)	Too many lights of over 4 c.p.....	46
7. 10 (7)	No rear lights.....	79
8. 10 (13)	Revolving light.....	23
9. 12	Trucks without mirrors.....	64
10. 14	Unnecessary noise.....	21
11. 17	No chauffeur license.....	111
12. 22	No garage license.....	7
13. 24	Exceeding speed limit.....	16,350
14. 25	Reckless driving.....	2,127
15. 26	Racing.....	14
16. 27	Speeding (heavy trucks).....	21
17. 32	Excess load in March and April.....	124
18. 38 (1)	Passing standing street car.....	48
19. 38 (2)	Passing street car on wrong side.....	64
20. 41	Failure to return to scene of accident.....	61
21. 44	Operating while under age.....	88
22. 45	Persons hiring vehicles without licenses.....	5
23. 46	Driving while intoxicated.....	146
24. Miscellaneous	.....	159

Total fines, \$151,983; total costs, \$55,317.35; total convictions, 20,958; total fines received by Provincial Treasurer, \$31,783.

NOTE.—Fines imposed for offences committed on other than Provincial Highways are paid to the municipality in which the offence is committed.

PUBLIC VEHICLES—1925

Total lines operated.....		91
Total busses licensed.....		210
	Country Roads	Provincial Highways
Total length of routes operated.....	595 miles	1,417 miles
Number of routes less than 15 miles.....	21	30
Number of routes over 15 and under 25.....	12	12
Number of routes over 25 and under 50.....	4	5
Number of routes over 50.....	...	7
Total vehicle miles per month.....	99,446	179,225

APPENDIX No. 25

PASSENGER CARS REGISTERED—1923

Counties		Cities		Total
Algoma.....	939	Sault Ste. Marie.....	1,354	2,293
Brant.....	1,977	Brantford.....	2,136	4,113
Bruce.....	4,000	.....	.....	4,000
Carleton.....	2,455	Ottawa.....	6,143	8,598
Dufferin.....	1,813	.....	.....	1,813
Dundas.....	1,616	.....	.....	1,616
Durham.....	2,117	.....	.....	2,117
Elgin.....	3,596	St. Thomas.....	1,559	5,155
Essex.....	8,192	Windsor.....	4,888	13,080
Frontenac.....	1,607	Kingston.....	1,493	3,100
Glengarry.....	981	.....	.....	981
Grenville.....	1,093	.....	.....	1,093
Grey.....	4,140	Owen Sound.....	970	5,110
Haldimand.....	2,860	.....	.....	2,860
Haliburton.....	193	.....	.....	193
Halton.....	2,638	.....	.....	2,638
Hastings.....	3,943	Belleville.....	1,103	5,046
Huron.....	4,811	.....	.....	4,811
Kenora.....	261	.....	.....	261
Kent.....	6,262	Chatham.....	1,682	7,944
Lambton.....	4,300	Sarnia.....	1,553	5,853
Lanark.....	2,320	.....	.....	2,320
Leeds.....	2,927	.....	.....	2,927
Lennox and Addington.....	1,715	.....	.....	1,715
Lincoln.....	2,503	St. Catharines.....	1,732	4,235
Manitoulin.....	503	.....	.....	503
Middlesex.....	5,497	London.....	5,636	11,133
Muskoka.....	1,015	.....	.....	1,015
Nipissing.....	1,244	.....	.....	1,244
Norfolk.....	2,781	.....	.....	2,781
Northumberland.....	2,936	.....	.....	2,936
Ontario.....	4,220	.....	.....	4,220
Oxford.....	4,574	Woodstock.....	790	5,364
Parry Sound.....	1,000	.....	.....	1,000
Peel.....	2,575	.....	.....	2,575
Perth.....	3,740	Stratford.....	1,379	5,119
Peterboro.....	1,898	Peterboro.....	1,546	3,444
Prescott.....	1,047	.....	.....	1,047
Prince Edward.....	1,848	.....	.....	1,848
Rainy River.....	761	.....	.....	761
Renfrew.....	2,621	.....	.....	2,621
Russell.....	672	.....	.....	672
Simcoe.....	6,651	.....	.....	6,651
Stormont.....	1,708	.....	.....	1,708
Sudbury.....	1,331	.....	.....	1,331
Thunder Bay.....	461	Fort William.....	1,172	.....
.....	.....	Port Arthur.....	986	2,619
Temiskaming.....	1,359	.....	.....	1,359
Victoria.....	2,795	.....	.....	2,795
Waterloo.....	3,989	Galt.....	1,059	.....
.....	.....	Kitchener.....	2,081	7,129
Welland.....	4,061	Niagara Falls.....	1,799	.....
.....	.....	Welland.....	934	6,794
Wellington.....	3,422	Guelph.....	1,416	4,838
Wentworth.....	3,393	Hamilton.....	9,627	13,020
York.....	8,294	Toronto.....	46,742	55,036
Foreign.....	380	.....	.....	380
	146,035		99,780	245,815

OCCUPATIONS

Farmers.....	75,583
Merchants.....	21,395
Professional.....	13,612
Livery and garages.....	6,539
Commercial travellers.....	8,523
Manufacturers.....	6,897
Tradesmen.....	34,383
Agents.....	9,807
Contractors.....	5,342
Managers.....	11,023
Unclassified.....	35,411
Unoccupied.....	16,524
Municipal corporations.....	254
Public utilities.....	97
Banks.....	20
Railways.....	8
Dominion Government.....	102
Ontario Government.....	296
	<hr/>
	245,815

Horse Power

Fords 22.5.....	118,052
15.....	112
16-20.....	35,553
21-25.....	64,445
26-30.....	23,111
31-35.....	2,229
36-40.....	1,715
41-45.....	336
46-50.....	137
51-up.....	35
Electric.....	90
	<hr/>
	245,815

Motive Power

Gasoline.....	245,720
Electric.....	90
Steam.....	5
	<hr/>
	245,815

Registrations

Original.....	42,419
Renewal.....	203,396
	<hr/>
	245,815

Models

Touring cars.....	187,762
Runabouts.....	14,958
Sedans.....	24,625
Coupes.....	18,401
Taxicabs.....	69
	<hr/>
	245,815

Cylinders

Less than 4 cylinders.....	11
4 cylinders.....	215,586
6 cylinders.....	28,085
8 cylinders.....	1,807
12 cylinders.....	236
Electric.....	90
	<hr/>
	245,815

COMMERCIAL CARS REGISTERED—1923

Counties		Cities		Total
Algoma.....	115	Sault Ste. Marie.....	127	242
Brant.....	140	Brantford.....	363	503
Bruce.....	180	.....	.....	180
Carleton.....	221	Ottawa.....	1,025	1,246
Dufferin.....	70	.....	.....	70
Dundas.....	58	.....	.....	58
Durham.....	91	.....	.....	91
Elgin.....	154	St. Thomas.....	153	307
Essex.....	991	Windsor.....	843	1,834
Frontenac.....	60	Kingston.....	278	338
Glengarry.....	32	.....	.....	32
Grenville.....	90	.....	.....	90
Grey.....	150	Owen Sound.....	92	242
Haldimand.....	177	.....	.....	177
Haliburton.....	5	.....	.....	5
Halton.....	336	.....	.....	336
Hastings.....	227	Belleville.....	152	379
Huron.....	220	.....	.....	220
Kenora.....	35	.....	.....	35
Kent.....	352	Chatham.....	255	607
Lambton.....	234	Sarnia.....	150	384
Lanark.....	106	.....	.....	106
Leeds.....	210	.....	.....	210
Lennox and Addington.....	105	.....	.....	105
Lincoln.....	498	St. Catharines.....	436	934
Manitoulin.....	8	.....	.....	8
Middlesex.....	283	London.....	961	1,244
Muskoka.....	82	.....	.....	82
Nipissing.....	101	.....	.....	101
Norfolk.....	219	.....	.....	219
Northumberland.....	185	.....	.....	185
Ontario.....	376	.....	.....	376
Oxford.....	342	Woodstock.....	106	448
Parry Sound.....	57	.....	.....	57
Peel.....	334	.....	.....	334
Perth.....	180	Stratford.....	156	336
Peterboro.....	88	Peterboro.....	184	272
Prescott.....	68	.....	.....	68
Prince Edward.....	136	.....	.....	136
Rainy River.....	54	.....	.....	54
Renfrew.....	147	.....	.....	147
Russell.....	51	.....	.....	51
Simcoe.....	469	.....	.....	469
Stormont.....	87	.....	.....	87
Sudbury.....	118	.....	.....	118
Thunder Bay.....	36	Fort William.....	202	.....
.....	.....	Port Arthur.....	136	374
Temiskaming.....	185	.....	.....	185
Victoria.....	181	.....	.....	181
Waterloo.....	266	Galt.....	131	.....
.....	.....	Kitchener.....	295	692
Welland.....	439	Niagara Falls.....	313	.....
.....	.....	Welland.....	121	873
Wellington.....	148	Guelph.....	169	317
Wentworth.....	587	Hamilton.....	1,640	2,227
York.....	1,447	Toronto.....	8,425	9,872
Foreign.....	368	.....	.....	368
11,959		16,653		28,612

OCCUPATIONS.		
Farmers.....	3,802	
Merchants.....	9,333	
Professional.....	143	
Livery and garages.....	1,015	
Commercial travellers.....	142	
Manufacturers.....	2,858	
Tradesmen.....	1,948	
Agents.....	604	
Contractors.....	5,304	
Managers.....	252	
Unclassified.....	1,458	
Onoccupied.....	309	
Municipal corporations.....	535	
Public utilities.....	522	
Banks.....	24	
Railways.....	61	
Dominion Government.....	166	
Ontario Government.....	186	
		28,612

Tonnage		
1½.....	9,940	
1.....	11,693	
1½.....	3,291	
2.....	1,387	
2½.....	519	
3.....	479	
3½.....	420	
4.....	163	
4½.....	118	
5.....	472	
5½.....	3	
6.....	14	
6½.....	4	
7.....	1	
Up.....	.....
Fire trucks.....	108	
		28,612

Motive Power		
Gasoline.....	28,552	
Electric.....	56	
Steam.....	4	
		28,612

Registrations		
Original.....	5,691	
Renewal.....	22,921	
		28,612

Models		
Busses.....	456	
Delivery.....	4,838	
Trucks.....	22,718	
Ambulance.....	94	
Hearse.....	336	
Casket wagons.....	27	
Patrols.....	14	
Fire Trucks.....	108	
Street cleaners.....	21	
		28,612

APPENDIX No. 26

PASSENGER CARS REGISTERED—1924

Counties		Cities		Total
Algoma.....	1,167	Sault Ste. Marie.....	1,650	2,817
Brant.....	1,995	Brantford.....	2,332	4,327
Bruce.....	4,562	.....	.....	4,562
Carleton.....	2,767	Ottawa.....	6,854	9,621
Dufferin.....	1,856	.....	.....	1,856
Dundas.....	1,822	.....	.....	1,822
Durham.....	2,315	.....	.....	2,315
Elgin.....	3,924	St. Thomas.....	1,705	5,629
Essex.....	8,977	Windsor.....	5,829	14,806
Frontenac.....	1,716	Kingston.....	1,609	3,325
Glenarry.....	1,049	.....	.....	1,049
Grenville.....	1,297	.....	.....	1,297
Grey.....	4,331	Owen Sound.....	1,062	5,393
Haldimand.....	3,039	.....	.....	3,039
Haliburton.....	312	.....	.....	312
Halton.....	2,767	.....	.....	2,767
Hastings.....	4,304	Belleville.....	1,155	5,459
Huron.....	4,978	.....	.....	4,978
Kenora.....	261	.....	.....	261
Kent.....	6,422	Chatham.....	1,747	8,169
Lambton.....	4,627	Sarnia.....	1,725	6,352
Lanark.....	2,519	.....	.....	2,519
Leeds.....	3,194	.....	.....	3,194
Lennox and Addington.....	1,839	.....	.....	1,839
Lincoln.....	2,746	St. Catharines.....	1,962	4,708
Manitoulin.....	575	.....	.....	575
Middlesex.....	6,017	London.....	6,098	12,115
Muskoka.....	1,260	.....	.....	1,260
Nipissing.....	1,627	.....	.....	1,627
Norfolk.....	2,961	.....	.....	2,961
Northumberland.....	3,124	.....	.....	3,124
Ontario.....	3,276	Oshawa.....	1,478	4,754
Oxford.....	4,964	Woodstock.....	929	5,893
Parry Sound.....	1,134	.....	.....	1,134
Peel.....	2,678	.....	.....	2,678
Perth.....	3,960	Stratford.....	1,606	5,566
Peterboro.....	2,088	Peterboro.....	1,920	4,008
Prescott.....	1,138	.....	.....	1,138
Prince Edward.....	2,000	.....	.....	2,000
Rainy River.....	910	.....	.....	910
Renfrew.....	2,908	.....	.....	2,908
Russell.....	861	.....	.....	861
Simcoe.....	7,392	.....	.....	7,392
Stormont.....	1,802	.....	.....	1,802
Sudbury.....	1,556	.....	.....	1,556
Thunder Bay.....	561	Fort William.....	1,481	3,288
.....	.....	Port Arthur.....	1,246	1,992
Temiskaming.....	1,992	.....	.....	2,913
Victoria.....	2,913	Galt.....	1,152	.....
Waterloo.....	4,435	Kitchener.....	2,300	7,887
.....	.....	Niagara Falls.....	2,091	.....
Welland.....	4,632	Welland.....	962	7,685
.....	.....	Guelph.....	1,567	5,086
Wellington.....	3,519	Hamilton.....	10,790	14,443
Wentworth.....	3,653	Toronto.....	50,696	60,904
York.....	10,208	.....	.....	465
Foreign.....	465	.....	.....	.....
	159,395		111,946	271,341

PASSENGER CARS REGISTERED—1924

Horse Power		
Fords, 22.5.....	128,921	
15.....	73	
16-20.....	42,248	
21-25.....	71,487	
26-30.....	24,184	
31-35.....	2,240	
36-40.....	1,709	
41-45.....	286	
46-50.....	107	
51-up.....	3	
Electric.....	83	
		271,341
Motive Power		
Gasoline.....	271,253	
Electric.....	83	
Steam.....	5	
		271,341
Registrations		
Original.....	34,241	
Renewal.....	237,100	
		271,341
Models		
Touring cars.....	194,721	
Runabout.....	15,415	
Sedan.....	36,231	
Coupe.....	24,736	
Taxicab.....	238	
		271,341
Cylinders		
Less than 4 cylinders.....	1	
4 cylinders.....	235,839	
6 cylinders.....	33,344	
8 and 12 cylinders.....	2,074	
Electric.....	83	
		271,341

COMMERCIAL CARS REGISTERED—1924

Counties		Cities		Total
Algoma.....	98	Sault Ste. Marie.....	179	277
Brant.....	168	Brantford.....	375	543
Bruce.....	197	.....	.....	197
Carleton.....	239	Ottawa.....	1,061	1,300
Dufferin.....	78	.....	.....	78
Dundas.....	86	.....	.....	86
Durham.....	99	.....	.....	99
Elgin.....	272	St. Thomas.....	163	435
Essex.....	1,097	Windsor.....	986	2,083
Frontenac.....	102	Kingston.....	219	321
Glengarry.....	45	.....	.....	45
Grenville.....	103	.....	.....	103
Grey.....	183	Owen Sound.....	106	289
Haldimand.....	192	.....	.....	192
Haliburton.....	80	.....	.....	80
Halton.....	359	.....	.....	359
Hastings.....	236	Belleville.....	174	410
Huron.....	243	.....	.....	243
Kenora.....	54	.....	.....	54
Kent.....	438	Chatham.....	303	741
Lambton.....	267	Sarnia.....	168	435
Lanark.....	111	.....	.....	111
Leeds.....	269	.....	.....	269
Lennox and Addington.....	150	.....	.....	150
Lincoln.....	527	St. Catharines.....	399	926
Manitoulin.....	14	.....	.....	14
Middlesex.....	330	London.....	999	1,329
Muskoka.....	98	.....	.....	98
Nipissing.....	117	.....	.....	117

Counties		Cities		Total
Norfolk.....	287	.....	.....	287
Northumberland.....	285	.....	.....	285
Ontario.....	320	Oshawa.....	158	478
Oxford.....	360	Woodstock.....	168	528
Parry Sound.....	76	.....	.....	76
Peel.....	381	.....	.....	381
Perth.....	283	Stratford.....	183	466
Peterboro.....	94	Peterboro.....	203	297
Prescott.....	87	.....	.....	87
Prince Edward.....	163	.....	.....	163
Rainy River.....	62	.....	.....	62
Renfrew.....	174	.....	.....	174
Russell.....	80	.....	.....	80
Simcoe.....	478	.....	.....	478
Stormont.....	137	.....	.....	137
Sudbury.....	151	.....	.....	151
Thunder Bay.....	79	Fort William.....	256	
.....		Port Arthur.....	161	496
Temiskaming.....	257	.....	.....	257
Victoria.....	177	.....	.....	177
Waterloo.....	278	Galt.....	140	
.....		Kitchener.....	307	725
Welland.....	528	Niagara Falls.....	323	
.....		Welland.....	172	1,023
Wellington.....	195	Guelph.....	175	370
Wentworth.....	652	Hamilton.....	1,683	2,335
York.....	1,680	Toronto.....	8,544	10,224
Foreign.....	367	.....	.....	367
	13,883		17,605	31,488

Tonnage

1/2.....	11,624
1.....	12,897
1 1/2.....	3,190
2.....	1,257
2 1/2.....	598
3.....	526
3 1/2.....	412
4.....	253
4 1/2.....	91
5.....	359
5 1/2.....	2
6.....	1
6 1/2.....	1
Municipal.....	277
	31,488

Registrations

Original.....	8,390
Renewal.....	23,098
	31,488

Models

Busses.....	384
Delivery.....	4,748
Trucks.....	25,666
Ambulance.....	119
Hearse.....	388
Patrols.....	9
Fire Trucks.....	138
Street Cleaners.....	22
Tractors.....	14
	31,488

APPENDIX No. 27

PASSENGER CARS REGISTERED—1925

Counties		Cities		Total
Algoma.....	1,634	Sault Ste. Marie.....	1,861	3,495
Brant.....	2,299	Brantford.....	2,564	4,863
Bruce.....	4,987	.....	.....	4,987
Carleton.....	2,937	Ottawa.....	7,823	10,760
Dufferin.....	2,018	.....	.....	2,018
Dundas.....	1,980	.....	.....	1,980
Durham.....	2,517	.....	.....	2,517
Elgin.....	4,214	St. Thomas.....	2,184	6,398
Essex.....	10,197	Windsor.....	6,311	16,508
Frontenac.....	1,985	Kingston.....	1,866	3,851
Glengarry.....	1,212	.....	.....	1,212
Grenville.....	1,473	.....	.....	1,473
Grey.....	4,993	Owen Sound.....	1,161	6,154
Haldimand.....	3,481	.....	.....	3,481
Haliburton.....	359	.....	.....	359
Halton.....	3,049	.....	.....	3,049
Hastings.....	4,982	Belleville.....	1,396	6,378
Huron.....	5,713	.....	.....	5,713
Kenora.....	394	.....	.....	394
Kent.....	6,591	Chatham.....	1,916	8,507
Lambton.....	5,392	Sarnia.....	1,961	7,353
Lanark.....	2,775	.....	.....	2,775
Leeds.....	3,573	.....	.....	3,573
Lennox and Addington.....	2,044	.....	.....	2,044
Lincoln.....	2,930	St. Catharines.....	2,191	5,121
Manitoulin.....	554	.....	.....	554
Middlesex.....	6,275	London.....	6,982	13,257
Muskoka.....	1,640	.....	.....	1,640
Nipissing.....	1,493	North Bay.....	906	2,399
Norfolk.....	3,511	.....	.....	3,511
Northumberland.....	3,281	.....	.....	3,281
Ontario.....	3,520	Oshawa.....	1,676	5,196
Oxford.....	5,272	Woodstock.....	1,026	6,298
Parry Sound.....	1,703	.....	.....	1,703
Peel.....	3,295	.....	.....	3,295
Perth.....	4,252	Stratford.....	1,779	6,031
Peterboro.....	2,400	Peterboro.....	1,965	4,365
Prescott.....	1,280	.....	.....	1,280
Prince Edward.....	2,233	.....	.....	2,233
Rainy River.....	892	.....	.....	892
Renfrew.....	3,284	.....	.....	3,284
Russell.....	1,005	.....	.....	1,005
Simcoe.....	8,454	.....	.....	8,454
Stormont.....	2,082	.....	.....	2,082
Sudbury.....	974	.....	.....	974
Thunder Bay.....	596	Fort William.....	1,601	.....
.....	.....	Port Arthur.....	1,336	3,533
Temiskaming.....	2,369	.....	.....	2,369
Victoria.....	3,297	.....	.....	3,297
Waterloo.....	4,951	Galt.....	1,287	.....
.....	.....	Kitchener.....	2,466	8,704
Welland.....	6,039	Niagara Falls.....	2,362	.....
.....	.....	Welland.....	1,254	9,655
Wellington.....	3,606	Guelph.....	1,791	5,397
Wentworth.....	3,857	Hamilton.....	11,524	15,381
York.....	11,514	Toronto.....	56,841	68,355
Foreign.....	348	.....	.....	348
	177,706		126,030	303,736

Horse-power

4-cylinder less than 25 horse-power.....	256,199	
4-cylinder more than 25 and up to 35 horse-power.....	3,383	
4-cylinder less than 35 and up to 50 horse-power.....	28	
		259,610
6-cylinder less than 25 horse-power.....	15,327	
6-cylinder more than 25 and up to 35 horse-power.....	24,627	
6-cylinder more than 35 and up to 50 horse-power.....	1,706	
6-cylinder more than 50 horse-power.....	107	
		41,767
8-12-cylinder more than 25 and up to 35 horse-power.....	3	
8-12-cylinder more than 35 and up to 50 horse-power.....	1,813	
8-12-cylinder more than 50 horse-power.....	463	
		2,279
Electric.....	80	80
		303,736

Models

Open cars.....	213,468
Closed cars.....	90,268
	303,736

Registrations

Originals.....	40,377
Renewals.....	263,359
	303,736

Occupations

Farmers.....	86,434
Merchants.....	23,332
Professional.....	17,487
Liveries and Garages.....	4,895
Salesmen, Travellers, etc.....	17,018
Manufacturers.....	7,431
Tradesmen.....	43,907
Managers.....	16,324
Unclassified.....	52,117
Unoccupied.....	33,834
Municipal.....	574
Dominion Government.....	77
Ontario Government.....	306
	303,736

COMMERCIAL CARS REGISTERED—1925

Counties		Cities		Total
Algoma.....	116	Sault Ste. Marie.....	178	294
Brant.....	197	Brantford.....	367	564
Bruce.....	216			216
Carleton.....	316	Ottawa.....	1,191	1,507
Dufferin.....	84			84
Dundas.....	100			100
Durham.....	166			166
Elgin.....	243	St. Thomas.....	193	436
Essex.....	1,404	Windsor.....	1,088	2,492
Frontenac.....	147	Kingston.....	226	373
Glengarry.....	61			61
Grenville.....	148			148
Grey.....	192	Owen Sound.....	124	316
Haldimand.....	247			247
Haliburton.....	145			145
Halton.....	280			280
Hastings.....	260	Belleville.....	191	454
Huron.....	286			286
Kenora.....	48			48
Kent.....	452	Chatham.....	332	784
Lambton.....	352	Sarnia.....	201	553
Lanark.....	113			113
Leeds.....	271			271
Lennox and Addington.....	191			191
Lincoln.....	566	St. Catharines.....	428	994
Manitoulin.....	23			23
Middlesex.....	460	London.....	1,035	1,495
Muskoka.....	130			130

COMMERCIAL CARS REGISTERED—1925—Continued

Counties		Cities		Total
Nipissing.....	63	North Bay.....	71	134
Norfolk.....	340	.....	.....	340
Northumberland.....	345	.....	.....	345
Ontario.....	243	Oshawa.....	214	457
Oxford.....	419	Woodstock.....	158	577
Parry Sound.....	107	.....	.....	107
Peel.....	531	.....	.....	531
Perth.....	225	Stratford.....	184	409
Peterboro.....	136	Peterboro.....	224	360
Prescott.....	146	.....	.....	146
Prince Edward.....	135	.....	.....	135
Rainy River.....	71	.....	.....	71
Renfrew.....	190	.....	.....	190
Russell.....	76	.....	.....	76
Simcoe.....	540	.....	.....	540
Stormont.....	171	.....	.....	171
Sudbury.....	190	.....	.....	190
Thunder Bay.....	95	Fort William.....	254	526
.....	.....	Port Arthur.....	177	283
Temiskaming.....	283	.....	.....	208
Victoria.....	208	Galt.....	164	808
Waterloo.....	368	Kitchener.....	276	355
.....	.....	Niagara Falls.....	146	1,102
Welland.....	601	Welland.....	214	407
.....	.....	Guelph.....	1,826	2,586
Wellington.....	193	Hamilton.....	9,030	10,849
Wentworth.....	760	Toronto.....	.....	371
York.....	1,819	.....	.....	.....
Foreign.....	371	.....	.....	.....
.....	15,840	.....	18,850	34,690

Tires

Pneumatic.....	28,133	
Solid.....	5,814	
Municipal.....	370	
Ontario Government.....	211	
Dominion Government.....	162	34,690

Gross Weights—Pneumatic Tires

Less than two tons.....	11,847	
Of two tons and up to three tons.....	13,388	
More than three tons and up to four tons.....	1,826	
More than four tons and up to five tons.....	648	
More than five tons and up to six tons.....	223	
More than six tons and up to seven tons.....	129	
More than seven tons and up to eight tons.....	55	
More than eight tons and up to nine tons.....	10	
More than nine tons and up to ten tons.....	7	28,133

Gross Weights—Solid Tires

Less than two tons.....	163	
Of two tons and up to three tons.....	2,340	
More than three tons and up to four tons.....	328	
More than four tons and up to five tons.....	484	
More than five tons and up to six tons.....	681	
More than six tons and up to seven tons.....	442	
More than seven tons and up to eight tons.....	592	
More than eight tons and up to nine tons.....	326	
More than nine tons and up to ten tons.....	158	
More than ten tons and up to eleven tons.....	100	
More than eleven tons and up to twelve tons.....	200	
Municipal.....	370	
Ontario Government.....	211	
Dominion Government.....	162	6,557
.....	.....	34,690

Commercial Occupations

Farmers.....	4,727	
Merchants.....	11,925	
Busses.....	254	
Cartage and express less than 3 tons gross.....	1,477	
Cartage and express more than 3 tons gross.....	2,201	
Manufacturers.....	2,737	
Tradesmen.....	2,279	
Contractors, 3 tons gross or less.....	912	
Contractors, more than 3 tons gross.....	1,050	
Unclassified.....	6,385	
Municipal.....	370	
Dominion Government.....	162	
Ontario Government.....	211	
		34,690

APPENDIX No. 28

Motorcycle Registrations—	1923	1924	1925
Cities.....	3,057	2,601	2,460
Counties.....	1,268	1,340	1,288
Totals.....	4,325	3,941	3,748
Chauffeur Licenses—	1923	1924	1925
Cities.....	17,853	19,372	21,317
Counties.....	9,180	10,304	12,423
Totals.....	27,033	29,676	33,740
Trailer Permits—	1923	1924	1925
Cities.....	329	439	550
Counties.....	262	339	508
Totals.....	591	778	1,058
Dealers' Permits (Cars)—	1923	1924	1925
Cities.....	777	875	815
Counties.....	921	939	839
Totals.....	1,698	1,814	1,654
Dealers' Permits (Trucks)—	1923	1924	1925
Cities.....	77	67	59
Counties.....	13	12	9
Totals.....	90	79	68
Motorcycle Dealers—	1923	1924	1925
Totals.....	13	13	13
Class "A" Garages—	1923	1924	1925
Cities.....	674	729	759
Counties.....	740	891	890
Totals.....	1,440	1,622	1,649
Class "B" Garages—	1923	1924	1925
Cities.....	291	365	362
Counties.....	328	492	519
Totals.....	619	857	881

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UNIVERSITY OF TORONTO

ANNUAL REPORTS

OF THE

Department of Public Highways

ONTARIO

1926 and 1927

PRINTED BY ORDER OF
THE LEGISLATIVE ASSEMBLY OF ONTARIO



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TO HIS HONOUR WILLIAM DONALD ROSS,
Lieutenant-Governor of the Province of Ontario.

MAY IT PLEASE YOUR HONOUR:

I herewith beg to present for your consideration the Report of the Department of Public Highways, relating to Highway Improvement in the Province of Ontario during the years 1926 and 1927.

Respectfully submitted,

GEO. S. HENRY,
Minister of Public Works and Highways.

Department of Public Highways,
Toronto, March 1st, 1929.

TO THE HONOURABLE GEO. S. HENRY,
Minister of Public Works and Highways,
Ontario.

Sir,—I have the honour to submit the Report of the Department of Public Highways for the years 1926 and 1927, having special reference to works on the Provincial Highway System; work carried on by the several counties of Ontario, and by township councils.

Reference is also made to the operation of the Highway Traffic Act; and to other services within the purview of the Department of Public Highways.

I have the honour to be, Sir,
Yours respectfully,

R. M. SMITH,
Deputy Minister of Highways.

Parliament Buildings, Toronto, February 12, 1929.



No. 2 Provincial Highway, 5 miles east of Bowmanville.

HIGHWAY IMPROVEMENT IN ONTARIO

Report of R. M. Smith, Deputy Minister

The advance made in highway development during the last ten years, and more particularly the last three, brings us to a realization of achievement beyond our fondest hopes.

Commencing our highway activities from a Provincial point of view in 1918 with only forty-two miles of hard surfaced road, ten years later we find that 1,700 miles have been completed, concrete, asphalt, bituminous penetration, macadam and high type gravel roads stretching from west to east and from north to south, connecting cities, towns and villages with an all-season pavement, providing easy means of transportation and permitting of industrial and rural development that cannot be conceived in money value.

Ontario has made such strides in the last decade that one hardly recognizes old conditions. The farmer, the hamlet, the village or town have all kept pace with highway development, presenting to the tourist or motorist an appearance of progress and prosperity that cannot but react to our credit.

Our highways are being built not for pleasure or the tourist alone, but sufficiently rugged to stand the heaviest commercial traffic. The standard of construction has been raised from year to year, improvements in design and specifications being kept continually before us. While the high standard that we have set has slightly increased the price per mile of road, we believe the added cost can be justified. Not only have we improved on old design, but we have, through research and investigation, developed newer types which are meeting widespread approval.

In this connection, the "asphaltic mixed macadam" first laid in 1926 deserves special mention. This pavement is the result of the incessant demand by the travelling public for a surface that could be laid under traffic conditions and without detours. It has served this purpose. Further than that, it is economical in cost of construction, and, finally, its non-skid surface makes for safety in driving.

In developing our system of highways, engineers have been instructed to specially emphasize the safety in construction, the importance of straight lines, the value of clear vision, and finally to develop for the future. Hundreds of curves have been eliminated or improved, numerous grades have been reduced, fills widened and protected by guard-rail. In cases where construction does not entirely remove the menace, signs, directional and warning, have been erected throughout the entire length of our system. These symbol signs have materially added to the safety of our highways.

Railway grade crossings are also receiving their share of attention. Many diversions of the highway have been made, eliminating in all twenty level crossings in the last three years. We have also completed the construction of, or have under way, four overhead bridges or subways.

Many large bridges have also been completed under the supervision of our bridge department, the most important of these structures being the Caledonia bridge and the Plantagenet bridge.

Ontario, from its geographical position, must of necessity be surrounded by large bridges. The Peace bridge across the international boundary at Buffalo, and the Ambassador bridge under consideration at Windsor are samples of the larger type and typical expressions of good will between two great countries.

Further, because of its location, Ontario must of necessity keep pace with the development of the surrounding states and provinces. Their growth and prosperity cannot help but react to our benefit, and so Ontario has spent on its main trunk system of 2,500 miles during the last three years over \$25,000,000.

Our expenditure is not confined to trunk or provincial roads alone. The Province of Ontario supervises in an advisory capacity and contributes fifty per cent. of the cost of the construction of all county roads. We also pay a subsidy



[Black base, sheet asphalt top, Yonge Street, south of Barrie.

of thirty per cent. toward the cost of township roads. Keeping in mind that our county road system is 7,855 miles in length, and our township roads 41,731 miles in length, it will be appreciated that the government responsibility and expenditure is very heavy. In connection with these feeders to trunk roads, I am pleased to say that the last few years have shown a vast improvement. Practically sixty-six per cent. of this total mileage has been metalled, the major portion being in excellent condition.

Ontario can justly feel a keen sense of satisfaction with the results obtained. The work of construction is being economically carried on and well done. While engineers and officials usually receive the credit, our thanks and appreciation are extended to the contractor who, after all, is the man who does the work.

The Province of Ontario rightly feels that the foundation of our prosperity, our education, our progress and our future lays in our highways, that past expenditure and future expenditure can be justified and that it is the duty of this province to "carry on" improving and bettering our conditions that we may be a worthy unit in this Dominion of Canada, a part of the great British Empire.

Summary Highway Expenditure and Receipts, 1926 and 1927

During 1926 there was a total of over \$21,000,000.00 and during 1927 over \$26,000,000.00 spent on road improvement in Ontario either by the province or by the municipalities in co-operation with the province. This total was made up as follows:—

	1926	1927
Provincial Highways.....	\$6,524,407 99	\$9,063,930 81
County Roads.....	5,838,445 12	7,424,464 85
Township Roads.....	4,232,909 41	4,800,000 00*
Colonization Roads.....	296,317 27	498,188 75
Northern Development.....	3,770,078 79	3,922,363 80
Public Works Bridges.....	154,059 09	152,775 47
Connecting Links.....	65,564 20	2,044 40
Overhead, Miscellaneous Grants, etc.....	503,564 37	576,870 76
Indian Reserve Roads.....	37,747 60	45,650 00*
	<hr/> \$21,423,093 84	<hr/> \$26,486,288 84

*Estimated.

Of these expenditures approximately 20 per cent. of the cost of provincial highways will be paid by the counties and a certain proportion will be paid by cities and separated towns in provincial suburban areas, while 50 per cent. of the county roads expenditure is borne by the counties, and approximately 70 per cent. of the township roads expenditure is borne by the townships, so that from the above total we should deduct the following amounts to obtain the net Ontario Government expenditure:—

	1926	1927
Provincial Highway expenditure borne by counties.....	\$1,219,075 95	\$1,776,090 19
Provincial Highway expenditure borne by cities and separated towns.....	144,201 31	195,572 28
County Road expenditure borne by counties.....	2,924,784 16	3,717,744 97
Township Road expenditure borne by townships.....	2,915,763 24	3,330,000 00*
Indian Reserve expenditure borne by reserves.....	24,712 18	29,000 00*
Connecting Links portion borne by towns.....	32,782 10	1,022 20
	<hr/> \$7,261,318 94	<hr/> \$9,049,429 64

Deducting the above repayments leaves net Government expenditures as follows:—

1926	1927
\$14,161,774 90	\$17,436,859 20

Revenue	1926	1927
Gasoline Tax.....	\$3,376,090 56	\$4,032,941 72
Motor Vehicle Licenses.....	6,415,713 05	5,964,863 63
Miscellaneous Revenue.....	399,592 41	263,253 60
	<hr/> \$10,191,396 02	<hr/> \$10,261,058 95

*Estimated.

Deducting the above revenues from the net Government expenditure, leaves a total of \$3,970,378.88 for 1926 and \$7,175,800.25 for 1927, greater expenditure made by the Government than was collected from all sources of motor vehicle taxation.

Report on Provincial Highways

Report upon the work of constructing and maintaining the Provincial Highway System for the years 1926 and 1927

A. A. Smith, Chief Engineer of Highways

Increase in Mileage

During the years 1926 and 1927 the Department assumed an additional 535.29 miles of provincial highway, making in all a total of 2,371.21 miles.

The increases in the various types of road surfaces are shown in the following table:—

	Previous to 1926	End of 1927
Cement concrete pavement.....	355 miles	576.9 miles
Asphaltic concrete pavement.....	175 miles	264.4 miles
Bituminous penetration pavement.....	139 miles	228.5 miles
Macadam pavement.....	372 miles	433.05 miles
Gravel road.....	820.31 miles	868.36 miles
Total.....	1,861.31 miles	2,371.21 miles

Increased Safety by Improved Design

During the above-mentioned years many changes were made in the design and construction of road building by the Provincial Highway Department.



Mixed macadam. Reverse curve and checker board signs south of Caledon.

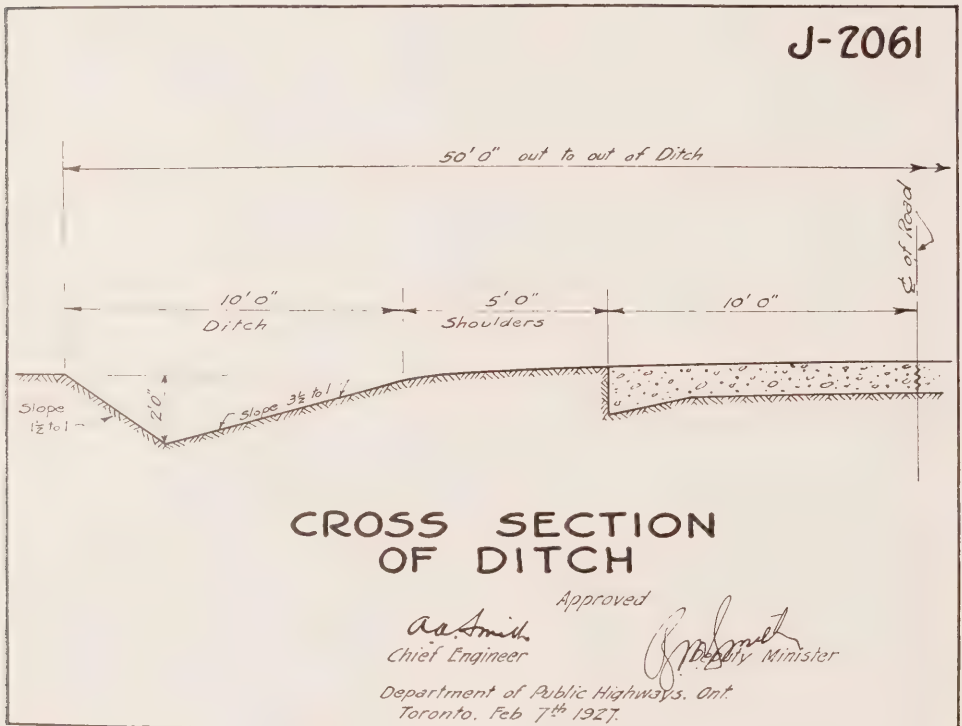
What previously was considered a safe curve is to-day looked upon as dangerous and consequently nothing less than a 500-foot radius with a super-elevation of from 12 inches to 30 inches on the pavement itself is considered, unless physical conditions absolutely prevent it.

Profiles of our highways are being improved each year. What was considered an easy grade on a hill is now considered too steep and to-day a maximum of four and five per cent. grades is aimed at on all of our main highways.

An effort is being made at the present time to eliminate danger on crests of hills by increased cutting, making better vision and thereby preventing head-on collisions.

Ditches on curves are being gradually eliminated by tiling. Also side slopes of ditches next to the road are constructed, where possible, with a $3\frac{1}{2}$ to 1 slope instead of a $1\frac{1}{2}$ to 1 slope, making it more difficult for cars to overturn.

At the ends of all dangerous curves several warning devices are being placed, consisting of checker boards, reflex and symbol signs. Guard-rails are also placed around the outside of the curves.



The pavement on the curve itself has been widened anywhere from one to three feet. An attempt is being made to have all advertising signs removed from the vicinity of curves, so as not to distract the attention of the driver.

Development in Construction Details and Design

In building pavements, the Department endeavours to use local material wherever obtainable.

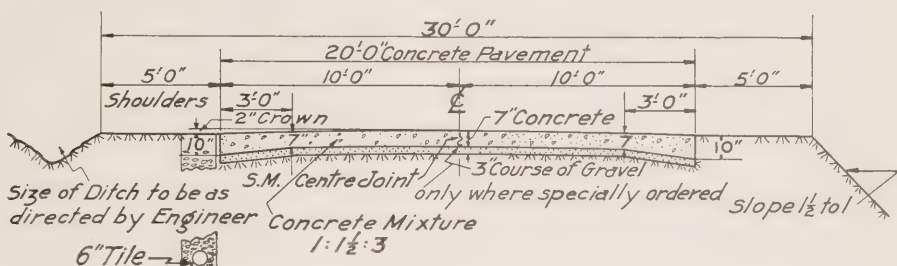
Concrete Pavement

For concrete pavements the gravel after being washed must be screened and again recombined to provide the required proportions.

Concrete pavements are constructed to a different design to those previously built. The depth of the concrete is now 10 inches at the edges and 7 inches at the centre. Transverse joints are no longer placed across the pavements, all contraction cracks being taken care of by the steel longitudinal centre joint, running the whole length of the pavement.

Materials are no longer permitted to be dumped on the sub-grade. They must be transported direct from the sidings or bins and placed in the hopper of the concrete mixer, thereby eliminating the chance of getting foreign material in the mix.

On account of the various changes made, it is felt that the class of road being built to-day is a vast improvement over the older types.



Many contractors have supplied themselves with a quantity of up-to-date equipment for the construction of concrete roads, including surface finishers, machines for the preparation of the sub-grade, for the preparation of the gravel to receive the forms, light railways for transporting material to the road, up-to-date gravel washing plants and various approved types of concrete mixers.

All this improved equipment facilitates the work of the contractor, so that with the accumulation of experience and their desire to make a good job, they are giving us the better results which are desired.

Mixed Macadam Pavement

A new type of pavement introduced by the Department in 1926 and known as "mixed macadam," is giving excellent results. Its main advantage is that detours during construction are entirely done away with.

Instead of the travelling public having to go anywhere from one mile to eight miles out of their way, over perhaps a narrow, dangerous and oftentimes a muddy road, they are permitted to drive right through the work while it is underway.

This method saves many thousands of dollars to the Department which would be expended in maintaining detours.

There is in addition the saving of time to the public and the avoidance of much wear and tear on the cars.

This type of pavement has a non-skid surface. It is very easy to maintain. Should settlement to the sub-grade occur, another light coat of the same material or cold patch can be placed upon it and brought up to the required surface level at a small extra cost, and without inconvenience to traffic.

The road is built in two courses, the base being 3 inches in depth and the top course 3 inches consolidated. The constituents of the mixture are approximately as follows:—

Stone passing 2-inch ring and retained on 1-inch screen.....	10-35%
Stone passing 1-inch ring and retained on 3/4-inch screen.....	30-50%
Stone passing 3/4-inch ring.....	35-45%
Bituminous asphalt cement.....	4-6%

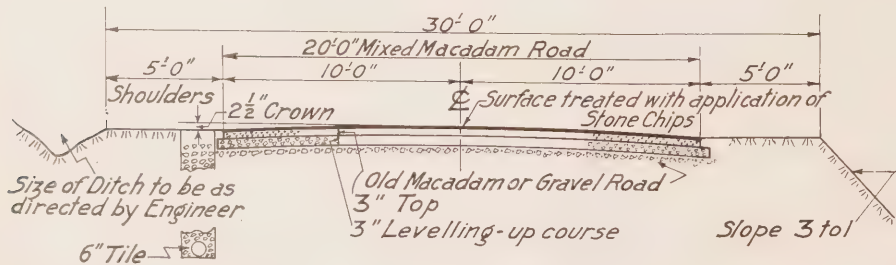
The materials are mixed in an approved asphalt plant and laid on the road at a temperature of 225° to 325°F.

After the top course is rolled and while it is still hot, chips are spread over the surface and the surface is again rolled.



Old bituminous penetration road on the Hamilton-Queenston Highway surface treated in 1927 with $\frac{1}{8}$ -gallon Heavy Cutback Asphalt and 15 pounds stone chips and coarse sand per square yard.

When the pavement is completed a surface treatment is applied. All materials are weighed and contractors are paid a tendered price per ton of mixed material delivered and consolidated on the road.



Traffic Bound Macadam

On many sections of the provincial highway we are faced with the scarcity of gravel and oftentimes with the absence of any road building material whatsoever.

On these sections the Department has tried out what is known as "traffic bound macadam," which consists of crushed stone passing a $1\frac{1}{4}$ inch circular screen, spread on the sub-grade to a depth of from 2 to 3 inches, and then maintained in the same manner as a gravel road.

This gives a traffic carrying surface until such time as the new fills are completely settled.

This type of construction is quickly built and has been found most economical and beneficial. It also supplies a good base for a higher type of pavement which follows.

Gravel Road

After culverts have been built and new grades prepared, gravel which passes a $1\frac{1}{4}$ -inch ring, is applied evenly to a width of 20 ft. and to a depth of from two to three inches. The gravel road of to-day consists of a smooth, wide and flat-crowned road, and if properly maintained provides one of the most pleasing surfaces over which to drive.



Gravel road maintained by ordinary dragging. Treated with $\frac{1}{4}$ -gal. gravel dust-laying oil.
Langstaff-Brooklin Highway.

In order to obtain the best results, the surface must be dragged continuously by the use of steel drags or road maintainers, drawn by horses or power units. Those driven by mechanical means have proved to be most efficient and economical. They are much heavier, have several cutting blades, and scarifier attachment. One of these maintainers will take care of from 15 to 25 miles of road.

Dust Layer

On gravel roads carrying traffic of 2,000 vehicles per day, it is estimated that about 1,000 cubic yards of gravel per mile per year will be blown off the road into the adjoining fields and lost for highway purposes. To prevent this great loss in material the Department has tried out two kinds of dust-layer. A light asphaltic road oil is applied to the gravel surface in quantities of not less than one-seventh and not more than one quarter gallon per square yard, depending upon the class of gravel on the surface. The cost averages \$300 per mile.

As an alternative method flake calcium chloride, is applied evenly in quantities of one and one-half to two pounds per square yard. The cost being also about \$300 per mile.



"V" type snow-plow

By using dust layer there is a tendency for the gravel to mat and produce a pitted surface. This must be carefully watched and may require light scaring at times.

It has been the aim of the Department to produce a more permanent dust-laying surface, having the same driving qualities, and always keeping in view the conservation of materials and the economical cost of same; consequently, a type has been developed known as the "Bituminous treated surface" or "Mulch method." The surface must have not less than three inches of loose gravel. This is treated with either Tarvia B or 60 per cent. or 80 per cent. asphaltic road oil, using approximately one-quarter imperial gallon per square yard. The gravel after treating is then windrowed to one side of the road and the old road

base is given an application of bitumen at the rate of one-quarter imperial gallon per square yard. The gravel windrow is then moved back evenly over the road and continuously dragged until same has been consolidated by the traffic. This type of road costs approximately \$3,000 per mile.

Snow Clearing

On account of the enormous increase of motor car, truck and bus traffic during the winter months, the Department has been faced with the necessity of keeping the main roads open all year. No attempt was made until the year 1920 to keep the roads clear of snow except for sleigh traffic. In that year, however, \$1,486 was expended for this purpose and the results obtained appeared to be adequate for that time.



Rotary type snow-plough.

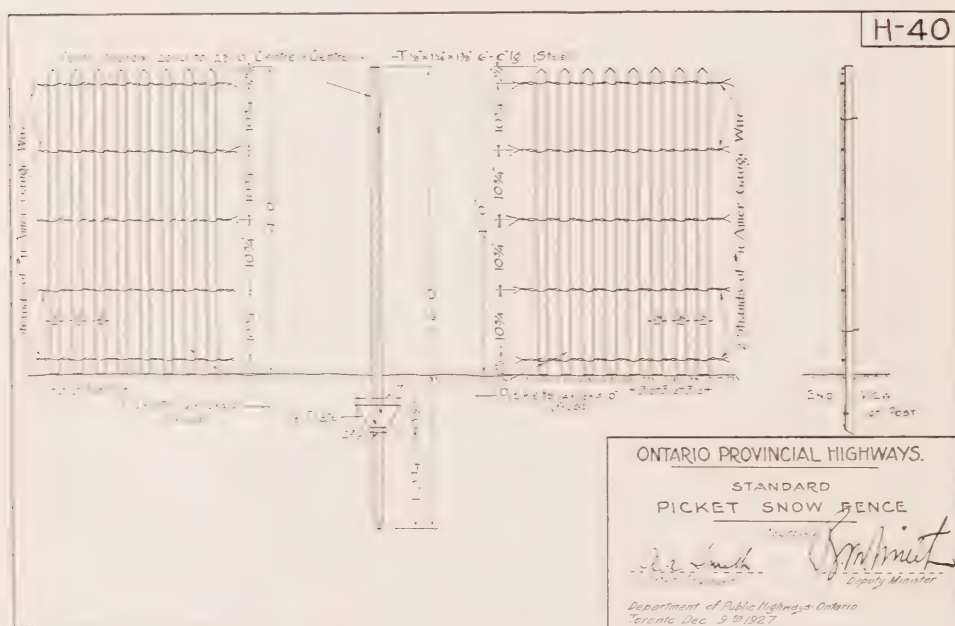
Increased pressure from motorists made the requirements each year more difficult to meet. But, our highways having been widened, old rail fences cleared off and new wire fences installed, bushes thinned, weeds cut and smooth road surface maintained, we have been usually able to combat snow conditions.

Each succeeding year brought its increased demands for open roads until the winter of 1926-27 when the Department was called upon to expend \$64,640 for this purpose. During the winter of 1927-28 the maintenance costs were \$104,441. For this sum the Department kept open 1,200 miles of provincial highway for all traffic throughout the winter. This works out at approximately \$87 per mile.

Various types of snow fences have been tried, but it is felt that to-day the wire picket fence is the most economical and effective.

Snow-removal equipment of various types has been used, including rotaries, nose and blade plows, all of which are attached to a heavy truck, preferably the four-wheel-drive type. The rotary plows are preferred where the snow is the deepest and where the highway parallels a radial line and the snow has to be thrown clear of the tracks.

During the year 1927-28, the Department owned and operated eight distinct snow-fighting units and rented twelve trucks which were equipped with necessary plows. These units were given beats varying from 40 to 80 miles in length.



Maintenance

The Department to-day is faced with the task of maintaining the pavements already constructed. In the past insufficient attention has been given to this work. Maintenance begins directly the road has been constructed. Highways are divided into patrols and one man is given anywhere from five to thirty-five miles to look after (the length of his beat depending on the type of road).

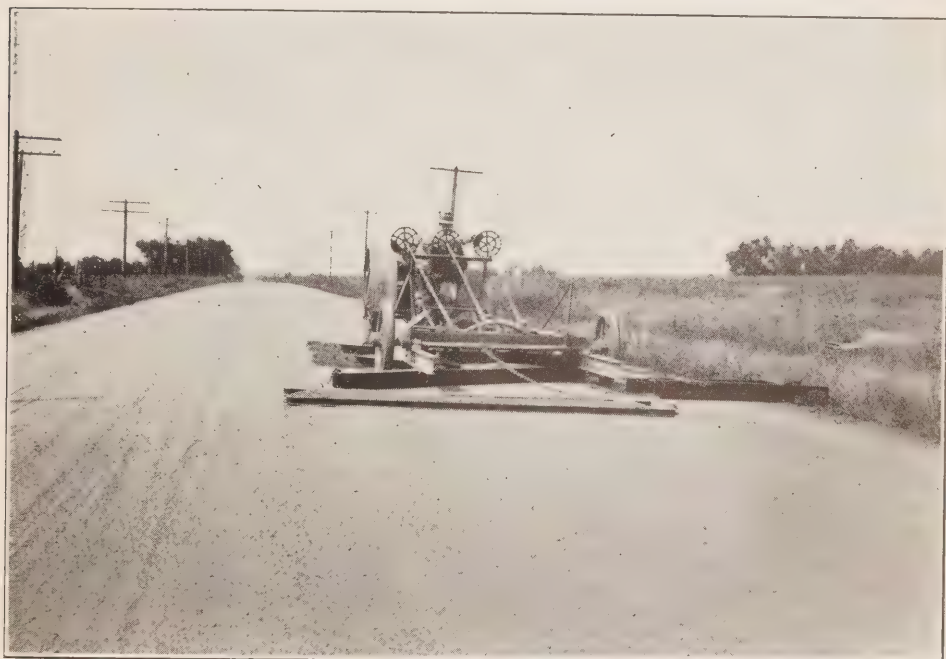
The patrolmen work under the direction of the resident engineer.

They are instructed that "Safety First" is to be their main thought. No bumps or holes in the road surface are tolerated and the entire road allowance between fences must be kept clean and tidy and free from noxious weeds.

Any credit which comes to the Province through the good condition of the roads is thus attributable in a large measure to the work of the faithful patrolmen.

PROVINCIAL HIGHWAY CONSTRUCTION, 1926

During 1926 an extensive programme of construction was carried out on the provincial highway system under rather adverse weather conditions. At the same time a programme of maintenance, greatly increased over previous years, was carried on. All gravel roads throughout the system were renewed where necessary and continuous dragging operations carried out. All macadam roads were surface treated and pavement joints were filled and cracks patched where required. The construction work done in 1926 construction season may be briefly summarized as follows:—



Modern gravel road maintenance.

Cement concrete pavement.....	80 $\frac{1}{4}$ miles
Asphaltic concrete pavement.....	11 "
Mixed macadam pavement.....	14 $\frac{1}{3}$ "
Bituminous penetration pavement.....	47.1 "
Macadam.....	27 $\frac{3}{4}$ "

On Road No. 2, east of Toronto the unpaved sections from Newtonville to Newcastle and Trenton westerly to just east of Grafton, about 27 $\frac{1}{2}$ miles in all, was completed. This, with the exception of a 2 $\frac{3}{4}$ -mile unpaved section at Grafton, gives continuous pavement either asphaltic concrete or concrete between Belleville and Toronto.

From the end of pavement three miles north of Whitby, an additional 3 $\frac{1}{2}$ miles of concrete pavement were laid, and on the same road a mile of concrete was laid at Oakwood.

West of Toronto, the following sections of concrete pavement were constructed:—

- 1 mile on the Burlington Beach Road.
- 9 miles easterly from Thamesville.
- 7½ miles between Comber and Ruscomb.
- 4½ miles north from Leamington, which completed the pavement between Windsor and Leamington.

West of Sheddon, on Highway No. 3, pavement was extended two miles, and north of London a small section completed also, three miles north from St. Mary's. On the Stratford-Goderich road, six miles were laid from Goderich south-easterly, and also five miles between Mitchell and Dublin. The concrete pavement north of Guelph was constructed a further distance north of six miles towards Fergus.



Black base, sheet asphalt top, Yonge Street.

Over 25 miles of asphaltic concrete pavement and mixed macadam was laid during 1926. East of Toronto, on the Kingston-Montreal road, 5.4 miles of mixed macadam was laid between Carleton and Johnstown, and the same type of pavement between North Gower and the Rideau river. With the paving of this latter section, a continuous pavement exists between Ottawa and the Rideau river on the Ottawa-Prescott road.

North of Toronto, mixed macadam, with a 1-inch asphaltic concrete top, was constructed north from Fennel about three miles on the Toronto-Barrie highway. A similar type of road was constructed on the Niagara Falls-Welland road from Welland northerly 6.4 miles, completing the pavement between Niagara Falls and Welland. Asphaltic concrete was also laid from Wardsville to Strathburn on Highway No. 2. This completed the last link between Toronto and Windsor.

Bituminous penetration pavement was laid between Kingston and Cataraqui; for $3\frac{1}{2}$ miles west of Gananoque; $3\frac{1}{2}$ miles east of Lansdowne; several miles at Mallorytown; $3\frac{1}{2}$ miles at Yonge's Mills diversion; about four miles in the vicinity of Iroquois and Morrisburg, and slightly under four miles from a point three miles east of Cornwall easterly.

Bituminous penetration pavement was also laid south from Pembroke for about five miles; and on the Ottawa-Point Fortune, several miles at Wendover, and $4\frac{3}{4}$ miles east from Alfred village; also half-mile at Stittsville village on the Ottawa-Carleton Place section.

West of Toronto, 7.3 miles of bituminous penetration were laid north from Brampton, and 4.41 miles between Renton and Simcoe; also four miles from Georgetown northerly.

Macadam roadway was laid in the following sections:—3.2 miles south from Belleville Bay bridge, and also a mile at Bloomfield on the Belleville-Picton road. On the Port Hope-Peterboro road, 5.24 miles was built between Fraserville and Baillieboro.

West of Toronto, on the Guelph-Brampton road, six miles of macadam was laid from Norval westerly; on the London-Chatham section, from Wardsville east to Kent County west limits, about $5\frac{1}{4}$ miles; and on the Orangeville-Owen Sound road, from Melancthon northerly, six miles of macadam was completed; also about $3\frac{1}{2}$ miles east of Kincardine, on the Arthur-Kincardine section.

Grading operations were carried out east of Toronto on the section between Portland and Lombardy, and from Joyceville to north of Seeley's Bay, on the Smith's Falls-Kingston road.

West of Toronto, grading was done south from Chatsworth, on the Hamilton-Chatsworth road; north from Markdale, on the Brampton-Owen Sound road, and a big cut made at Caledon mountain. At the south-east entrance to Hamilton, the Windermere cut-off was partially graded and a creek bridged.

A detailed schedule of construction is given in Appendix No. 1 and a schedule showing the division of costs between the Province, the counties, cities and separated towns in Appendices Nos. 3 and 4.

PROVINCIAL HIGHWAY CONSTRUCTION, 1927

In 1927, the following construction was carried out on the provincial highway system:—

Cement concrete pavement.....	129.6 miles
Asphaltic concrete.....	15 "
Mixed macadam.....	45.7 "
Penetration.....	30.5 "
Macadam.....	16 "

Concrete pavement was laid east of Toronto, as follows:—A small section at Grafton; 7.67 miles between Brooklin and Manchester; and $3\frac{1}{4}$ miles south from Bewdley on Port-Hope-Peterboro road; 5.34 miles south from Arnprior on the Ottawa-Pembroke road.

West of Toronto, on No. 3 Highway, 11.5 miles of concrete was laid from Simcoe to Delhi, giving continuous pavement or macadam roadway from Niagara Falls to just east of Delhi. From Courtland west, 4.4 miles were paved with

concrete, and likewise 5 miles east from Aylmer; 8.3 miles of concrete were laid from Wallacetown easterly; further west on No. 3, both east and west of Port Alma, a section of concrete 10 miles in length was laid, and 8.3 miles between Wheatley and Leamington.

On the London-Sarnia road, 10.66 miles of concrete were laid, giving continuous pavement from Sarnia to Warwick; and at the London end, concrete was laid from Hyde Park Corners to Lobo, nearly 6 miles. North of London, on the Proof Line road, concrete was laid from Birr south about $4\frac{1}{2}$ miles.

On the Guelph and Goderich road, over 6 miles of concrete pavement was laid between Dublin and Clinton; also between Seaforth and Mitchell; and from the Wellington County line westerly about 6.6 miles. This only leaves two sections to pave on this road.

Concrete pavement was also laid south from Fergus, completing the pavement north from Guelph as far as Fergus; south from Acton; at Clifford and Mildmay; north and south from Shelburne, and at Hamilton east entrance.

Asphaltic concrete, consisting of mixed macadam base with a 1-inch asphaltic concrete top, was laid from Barrie south for $9\frac{3}{4}$ miles; also three miles north of Aurora, and small sections at Richmond Hill and Wardsville village.

Mixed macadam, with a seal coat, was laid on the Port Hope-Peterborough road from Peterborough southerly $9\frac{1}{2}$ miles to Fraserville; and on No. 2 Highway, east of Kingston, 6.6 miles was laid immediately east of Gananoque; $5\frac{1}{3}$ miles at Mallorytown; 4.6 miles along the canal bank roads near Cardinal, and $7\frac{3}{4}$ miles east of Morrisburg.

Bituminous penetration pavement, which is usually laid with a levelling-up course of 4-inch stone, on which, after consolidation, a 3-inch consolidated penetrated top was laid, was built south of Pembroke for about $3\frac{1}{4}$ miles on the Ottawa-Pembroke road; on the Ottawa-Point Fortune road, 2 miles near Alfred and $7\frac{1}{2}$ east from Wendover were completed; on No. 2 Highway, 1 mile at North Lancaster and $2\frac{1}{2}$ miles at Mallorytown.

West of Toronto, $8\frac{3}{4}$ miles of bituminous penetration was laid between Brampton and Georgetown, also the approaches to Caledonia bridge; 5 miles of macadam at Wardsville had a penetration top added.

Macadam roadway was laid east from Kincardine for about 7 miles, and 9 miles between Joyceville and Seeley's Bay on the Kingston-Smith's Falls road.

Some of the more important grading operations were the cut-off from Clappison's to Galt road; the filling of eight spans of Belleville Bay bridge; widening Yonge Street north of Schomberg; construction of diversion at Portland, and also south of Pembroke near Cobden.

A large bridge at Plantagenet over the Nation river was completed, and a 650-foot bridge was built at Caledonia over the Grand river.

In addition to construction operations carried out under contract for the most part, an intensive programme of maintenance on the provincial highway system was handled by day labour under departmental employees. This work included such operations as pavement repair, gravelling operations, scarifying, grading of deviations, maintenance of detours, dust-laying operations, installation of tile drains and side-entrance tile, road dragging, shoulder trimming, weed-cutting, fence moving, guard-railing erection, and painting of symbol signs, guard-rails and bridges.

A detailed schedule of construction is given in Appendix No. 2, and a schedule showing the division of costs between the Province, the counties, cities, and separated towns in Appendices Nos. 3 and 4.

Report on Bridges Completed on Provincial Highways

A. B. Crealock, Bridge Engineer

While the bridge construction programme in point of number of bridges built was not as large as it had been during the three previous years, this part of the work was by no means slighted. In the period covered by this report there were seventeen bridges completed, amongst which were some very important structures.

The use of concrete as a bridge material had been adopted to as great an extent as possible some two years previously and the years 1926 and 1927 saw this material being used for several large multi-span structures. In the year 1926 the first concrete bow-string girder on the Provincial Highway System was opened for traffic.

The bridge over the Grand river at Freeport was completed in 1926. This structure is composed of seven similar concrete bow-string girders, each of approximately seventy-two feet span, and at the time of its opening was the largest structure of its type in Canada.

The Dredge Cut bridge, which spans a municipal drain a few miles west of Chatham, on No. 2 Highway, was also completed and opened. Highway No. 2 is the main highway from one end of the Province to the other and is a very heavily travelled road. The old structure at this point was very narrow and, in order to cross the stream which intersected the line of the highway at an acute angle, had been built with a sharp reverse curve at each end of the bridge. This created an extremely dangerous condition and in the replacement of this structure the line of the highway was kept straight throughout. This necessitated a four-span structure about two hundred and ten feet in length to cross a stream about seventy feet in width. The resulting structure and alignment is worthy of particular mention as the dangerous conditions prevailing have been entirely removed.

In the spring of 1926, an old stone arch in the town of Dundas, which had been in existence for over half a century, was washed out and traffic on this road had to be suspended. The construction of a temporary bridge was rushed and in four days this was completed and traffic was resumed on this road. Plans were immediately prepared for a new structure and this was built and completed during the summer.

Among other work constructed during 1926 might be mentioned extensions to three other bridges at various points in the Province, whereby narrow structures were widened, making them safe for present-day traffic.

A subway under the Canadian Pacific Railway, on the Guelph highway at the north of Cooksville, was also constructed and opened in 1926. This removed one more of the dangerous level crossings that exist throughout the Province.

During 1927, ten bridges were completed, of which seven were important structures and should receive special attention. The first of these is located in

the village of Delhi and is a reinforced concrete bow-string girder, having a span of one hundred and four feet and eight inches and being provided with a twenty-four-foot roadway and two sidewalks.

The village of Plantagenet is located about forty miles east of Ottawa on the Montreal road. The South Nation River runs through this village and was crossed by two old steel bridges which were narrow. The road through the village was also narrow and had a bad right-angle turn. In the reconstruction of these bridges a new location was used which had easy curves and on which the width was up to provincial highway standard. There were two bridges erected on this diversion. The main structure is a double span structure built of reinforced concrete of the bow-string girder type. Each span is about 119 feet in length and these are the longest spans of this type built on the system. The



Concrete Bowstring Girder Bridge, Plantagenet. Completed 1927.

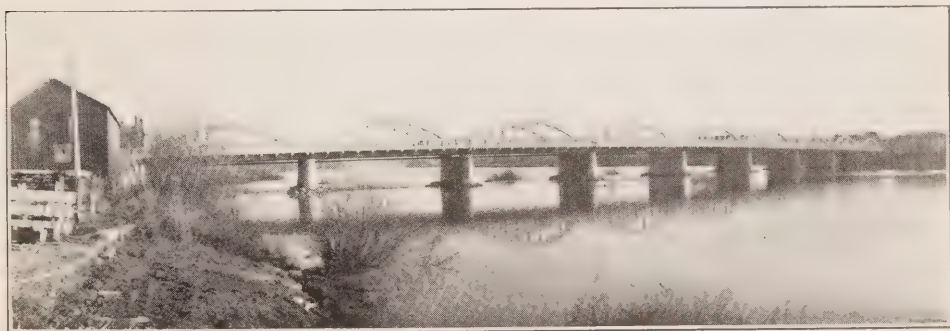
cross-sections provide a roadway twenty-four feet in width and one six-foot sidewalk. The second bridge is over a by-pass from the main stream and is a concrete girder bridge of thirty-four-foot span and provides the same width of roadway and sidewalk as the main structure.

The bridge constructed on the Windermere Cut-off is a steel truss with a span of eighty-two feet and provides a roadway thirty feet wide and two six-foot sidewalks. This structure is really built out in Burlington Bay and is supported on concrete abutments extending about fifteen feet below water level which are in turn supported on piles. This bridge, together with about four-fifths of a mile of road, forms the Windermere Cut-off and connects Burlington Beach

with the east end of the city of Hamilton. The building of this cut-off eliminated level crossings with nine railway and radial tracks, and from this standpoint alone has well served its purpose.

The structure at Caledonia is the longest concrete bridge on the system, exceeding the length of Freeport bridge opened in 1926, by 151 feet. This bridge is over the Grand river and is composed of nine spans with an overall length of 653 feet. Construction of this bridge was started early in June and the bridge was completed and opened for traffic on November 19th, some two weeks before the scheduled time. The construction of a bridge of this length containing some 2,400 cubic yards of concrete, of which 1,200 cubic yards were reinforced, the placing of 176 tons of reinforcing steel, the building of the temporary bridge, the removal of the old bridge, the grading and surfacing of the approaches, together with other incidental work such as erecting light standards, etc., in a period of 140 working days constituted a record for this part of the country at least.

The Department has for a number of years kept up a steady rate of progress on the replacement of the old structure over Belleville Bay which connects the mainland and the city of Belleville with Prince Edward County. The work on this structure for 1927 consisted of the replacement of the two northerly spans by new steel bridges and the filling in of spans Nos. 7, 8, 9 and 10. This com-



Complete Structure of New Bridge, Caledonia, November, 1927.

pleted the work for a distance of over 1,000 feet from the north end and leaves a distance of 780 feet still to be replaced either by fill or by new bridging.

A new steel bridge of eighty-two feet span was built on the Cobden diversion. This diversion provides a new route between Renfrew and Pembroke which follows the west side of Muskrat Lake and shortens the distance between these two towns by several miles. The concrete abutments for this structure were supported on timber piles. This type of construction was required due to the yielding nature of the sub-soil, the bridge being located in marshy ground.

A small concrete bow-string was also built in 1927 over Nash Creek on No. 2 Highway just east of Morrisburgh. Other structures completed in 1927 included extensions to Carp Bridge and La Fontaine Bridge on the Pembroke-Point Fortune Highway.

A resume of the work done on bridge construction during the years 1926 and 1927 shows that there were fewer bridges built during these two years than for some years previously, but that they included some of the most important structures that have been built on the provincial highway system.

The schedule of bridges completed on the provincial highways during 1926-27 will be found in Appendix No. 5.

ONTARIO AND THE MOTOR TOURIST

Report by K. A. Cockburn, Secretary

In order to obtain more definite information on which to base an estimate of the value of the motor tourist traffic, the Ontario Department of Public Highways during 1926 distributed through the customs officers a number of questionnaire postcards. These postcards requested the co-operation of the tourist, and asked them to oblige the Department when leaving the Province by filling in the desired information and mailing them to the Department. The questions on these cards were as follows: 1. Why did you come to Ontario? 2. Did you camp or stop at hotels or summer resorts or with friends? 3. How many persons in car? 4. How many days spent in Ontario? 5. How many miles covered? 6. Amount of money spent. 7. Remarks and criticisms.

The response to this request was very gratifying and the Department believes that a sufficient number of cards was received on which to base very fair estimates.

The answers to Question 1, "Why did you come to Ontario?" showed 10 per cent. came to visit friends and 12 per cent. to visit relatives, while 5 per cent. passed through Ontario because it afforded the shortest route to their destination. It would thus appear that the remaining 73 per cent. came to Ontario on account of our natural attractions. Of these latter, 54 per cent. gave their reason as touring or sightseeing in general, 4 per cent. to see Niagara Falls, 6 per cent. to see the Canadian National Exhibition, and 9 per cent. for fishing.

Question 2, "Did you camp or stop at hotels or summer resorts or with friends?" It was not possible to compile any definite information in this regard as in a great many cases motor tourists used all three methods of accommodation.

Question 3, "How many persons in car?" It was previously estimated by this Department that three persons per car was the average number of occupants. This census bears these figures out very closely as 3.2 persons per car is the number arrived at.

Question 4, "How many days spent in Ontario?" In figuring the number of days spent in Ontario, tourists entering the Province for 24 hours or less and also those coming for from one to six months have been disregarded, and only the figures taken into account of tourists using a thirty-day permit. Our census shows that this class of tourist stayed in Ontario for an average of seven days. This is one more than our previous estimate.

Question 5, "How many miles covered?" A Departmental estimate in this regard had not previously been made, but the information we now have would point to an average mileage per car of 528 miles.

Question 6, "Amount of money spent." Five dollars per day per person was our previous estimate of this expenditure. This figure is remarkably close, as the returns show the average expenditure per person to be \$34.95 covering a seven-day visit.

We have no definite information on the amount of money spent or distance covered by the tourists staying in Ontario for less than twenty-four hours or for those staying longer than thirty days. Assuming that cars entering Ontario for twenty-four hours or less contain the same number of passengers (that is 3.2), and that the expenditure per person amounts to \$1.00, we have an expenditure per car of \$3.20. During 1926, 1,289,412 entered Ontario under these twenty-four-hour permits and on the above assumption, spent a total of \$4,126,118.40. In the case of cars entering Ontario for periods of from thirty days to six months, we estimate that the average stay would be thirty days, with 3.2 persons per car and the expenditure \$5.00 per day per person. On this basis the value of this class of tourists would amount to \$480.00 per car. There were 2,112 cars taking advantage of this extended permit and the revenue from them may be estimated as amounting to \$1,493,760.

Taking the figures from our returns, we find that the average expenditure per car entering on a thirty-day permit amounted to \$111.94. As there were 263,114 cars belonging to this class of tourist, the revenue received may be estimated as amounting to \$29,452,981.16, making a total of \$35,072,859.56.

In all, we believe that this total of \$35,072,859.56 may be regarded as a quite conservative estimate of the amount of money spent in Ontario by motor tourists.

From the average number of miles per car (namely 528) and on the assumption that the gasoline consumption is twenty miles to the gallon, we arrive at an average gas tax per car of 79c or a total direct revenue to the Province from two to thirty-day tourists of \$181,154.90. Say four times this amount of \$3.20 per car from the one to six-month tourists and estimating an average of 10c a car gas tax from the twenty-four-hour tourists we arrive at a total estimated gas tax from motor tourists amounting to \$316,170.30.

Other interesting information compiled from these cards would appear to show that 45 per cent. of the tourist traffic originates in the two states having direct access by motor to southern Ontario, namely New York and Michigan, adding Ohio the total is raised to 58 per cent., adding Pennsylvania to 68 per cent., and Illinois to 76 per cent. Thus it would appear that over three quarters of motor visitors come from five states of the Union.

In connection with remarks and criticisms, it is particularly gratifying to note that 21 per cent. of the cards received mentioned the courteous treatment received from Ontario people, the police and customs officers in particular. Equally gratifying is the fact that 29 per cent. commented on the excellence of our roads. Other remarks outstanding on account of the numerous tourists commenting were the prosperous appearance of our country and the beautiful scenery of our Province.

Criticisms were remarkably few, only six correspondents in all complaining of the detours encountered. The most noticeable criticism dealt with our speed limit of 25 miles per hour—in every case this limit being declared to be much too low. This is a matter, however, that at the 1927 session of the Legislature has been altered, the speed limit having been increased to 35 miles per hour.

Motor Tourist Traffic, 1927

Using the same basis for purposes of estimating as employed for the year 1926, we arrive at the following revenue:

For a period not exceeding 24 hours.....	\$6,401,276 80
For a period not exceeding 60 days.....	46,336,328 72
For a period 60 days to 6 months.....	718,080 00
	<hr/>
	\$53,455,685 52

It will thus be seen that there was an increase of at least 52 per cent. in the tourist traffic of 1927 over that of 1926.

Ports of Entry

Statement showing the number of foreign automobiles imported into Canada for touring purposes during the calendar year 1927, for periods of 24 hours or less, between 24 hours and 60 days, and between 60 days and 6 months; also the number of Canadian automobiles exported for touring purposes for the same year:

Port	Admitted for period not exceeding 24 hours	Admitted for period not exceeding 60 days	Exceeding 60 days and not more than 6 months	Exported for touring purposes
Aultsville.....Ont.	2,249	4,850	.....	2,291
Bridgeburg....."	538,596	87,453	635	62,951
Brockville....."	3,009	6,572	13	2,156
Courtright....."	2,360	961	.....	181
Fort Frances....."	24,035	1,177	1	275
Fort William....."	.....	62	.....	2
Gananoque....."	233	4,837	3	627
Kingston....."	.....	842	10	231
Morrisburg....."	691	826	.....	932
Niagara Falls....."	752,361	124,980	126	103,486
Pigeon River....."	155	8,506	.....	2,023
Point Alexandria....."	13	93	.....	33
Port Arthur....."	.....	29	.....	23
Port Burwell....."	.....	1	.....	.....
Port Dover....."	.....	2,759	.....	207
Port Lambton....."	8,944	950	.....	380
Port Stanley....."	.....	1,272	.....	51
Prescott....."	6,854	10,181	9	6,385
Queenston Bridge....."	39,797	22,897	33	23,478
Rainy River....."	61	680	.....	450
Rockport....."	19	2,913	.....	112
Sarnia....."	40,854	33,775	31	8,660
Sault Ste. Marie....."	11,664	3,839	5	857
Sombra....."	6,550	633	.....	183
Toronto....."	512	91	92
Walkerville....."	213,072	20,674	262	3,961
Windsor....."	348,882	71,664	277	7,731
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	2,000,399	413,938	1,496	227,758

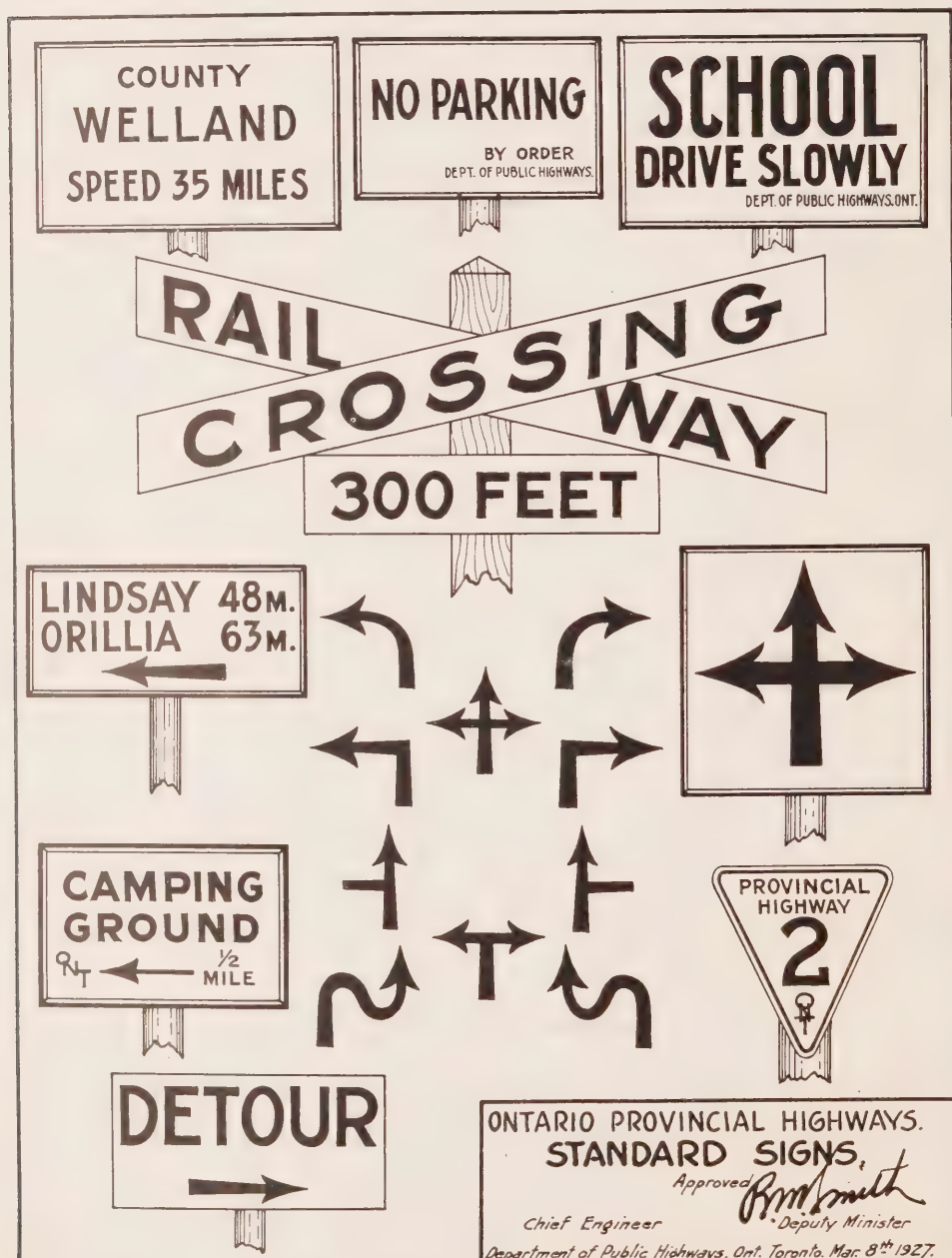
REGISTERED MOTOR TOURISTS
Statement of Motor Vehicles Admitted into Canada for Touring Purposes, 1924 to 1927

Province	Period exceeding 60 days and not more than 6 months				Period not exceeding 60 days				Period not exceeding 24 hours			
	1925		1926		1927		1924		1925		1926	
	1924	1925	1926	1927	1924	1925	1926	1927	1924	1925	1926	1927
Alberta.....	2	40	26	9	1,575	2,283	2,836	3,276	1,258	6,294	6,746	6,252
British Columbia.....	63	187	217	176	73,345	84,615	93,449	92,831	24,921	38,986	47,060	52,552
Manitoba.....	25	51	39	94	3,502	5,983	9,544	10,871	13,851	18,529	25,386	18,957
New Brunswick.....	124	193	176	41	6,605	11,682	14,233	22,971	236,641	476,555	51,024	136,172
Nova Scotia.....	104	162	171	590	4,409	532	638	469	Nil	Nil	Nil	Nil
Ontario.....	1,645	1,877	2,112	1,496	163,876	229,310	263,114	413,938	1,135,471	1,290,090	1,289,412	2,000,399
Prince Edward Island.....	12	20	20	3	Nil	8	7	17	Nil	Nil	Nil	Nil
Quebec.....	352	303	376	655	110,582	143,628	164,047	190,261	44,485	111,983	97,354	191,438
Saskatchewan.....	17	123	1,031	251	1,736	3,120	3,038	5,764	2,273	2,598	4,199	4,317
Canada.....	2,344	2,948	4,168	3,315	361,630	481,161	550,906	740,398	1,458,900	1,945,035	1,521,181	2,410,087

UNIFORMITY OF TRAFFIC REGULATIONS

Report by K. A. COCKBURN, Secretary

Ontario is fortunate in having all the major phases of traffic regulation throughout the entire Province controlled by the one Highway Traffic Act. In this way only local traffic problems are left for control by municipal by-law. During the past, however, considerable confusion arose through variations in local



traffic by-laws, and in order to overcome this objection an amendment to the Highway Traffic Act was passed in 1923 declaring that any by-laws passed by any municipal corporation which were inconsistent with the provisions of the Highway Traffic Act should be deemed to be repealed and that hereafter all by-laws for regulating traffic on highways shall be submitted to the Department of Public Highways for approval and shall not become operative unless so approved. The affect of this amendment was not very noticeable for the first few years. A series of standard clauses for insertion in municipal traffic by-laws was then prepared and circulated by the Department. The first draft of these standard clauses was amended and approved on April 19th, 1926, and is appended hereto.

Since the adoption of these standard clauses, they have been put into effect in practically every municipality in Ontario, to date 365 by-laws having been approved by the Department.

One very noticeable effect of this standardization is the stop signs, where in every case the wording and colouring is identical, the only variation allowed being between an octagonal sign or a square one. This uniformity has been very favourably commented upon.

In this matter of uniform traffic regulation, Ontario leads the way, as in no other province of the Dominion, nor in any state of the republic to the south, has such uniformity of traffic regulation been yet attained.

**STANDARD CLAUSES FOR INSERTION IN MUNICIPAL TRAFFIC BY-LAWS
APPROVED BY THE ONTARIO DEPARTMENT OF PUBLIC HIGHWAYS
APRIL 19th, 1926**

1. Definitions

(a) "Street" shall include a common and public highway, avenue, parkway, driveway, square, place, bridge, viaduct or trestle, designed and intended for, or used by, the general public for the passage of vehicles.

(b) "Vehicle" shall include motor vehicle, trailer, traction engine and any vehicle drawn, propelled, or driven by any kind of power, including muscular power, but not including the cars of electric or steam railways running only upon rails.

(c) "Park" as applied to a vehicle shall mean to allow the same to remain standing on a street for a longer period than — minutes (minimum 5 minutes) without a responsible person in charge.

(d) "Stand" as applied to a vehicle shall mean to stop for any period of time longer than actually required to take on or discharge passengers or merchandise.

(e) "Curb" shall include the edge of the travelled portion of the highway.

2. Police Control of Traffic

Absolute control of street traffic is vested in the police.

3. Keep Close to Curb

Vehicles moving slowly shall keep as close as possible to the curb on the right, allowing more swiftly moving vehicles free passage to their left.

4. Signals before Starting, Stopping or Turning

Drivers of vehicles before starting, stopping, turning or changing their course shall make sure that such movement can be made in safety and without obstructing traffic, and shall give a visible signal to persons driving vehicles behind them of their intention to make such movement.

5. Turning to Right

Drivers of vehicles intending to turn to the right into an intersecting street or highway shall first draw their vehicle in as close to the curb on the right as possible and turn the corner as sharply as possible.

6. Turning to Left

Drivers of vehicles intending to turn to the left into an intersecting street or highway shall first draw their vehicle out to the centre of the highway and continue beyond the centre of the intersection before turning.

7. Fire, Policewagons, Ambulances, etc.

The driver of a vehicle upon the approach or sounding of a signal of an ambulance, police vehicle, fire wagon, or other fire apparatus shall immediately draw up said vehicle as near as practical to the right hand curb and parallel thereto, and bring it to a standstill, and no vehicle shall follow any fire-fighting apparatus when responding to an alarm at a distance of less than 500 feet.

8. Street Cars and Fire Apparatus

The driver of a street car shall immediately stop said car and keep it stationary upon the rapid approach or sounding of the signal of a fire engine or wagon or other fire apparatus, provided that if on a street intersection such street car shall, if practicable, clear the intersection.

9. Blocking Traffic and Overloading

No vehicle shall be allowed to remain upon or be driven through any streets so as to blockade or obstruct traffic, and no vehicle shall be so overloaded that the horse or horses or motor power shall be unable to move it at a reasonable rate of speed.

10. Entering or Emerging from Doorways

No vehicle shall enter or emerge from an alley, stable, driveway or garage without giving a warning signal or at a rate faster than a walk.

11. Loading and Unloading

Whenever possible, vehicles shall be loaded or unloaded from the side and be parked within six inches of the curb. No vehicle shall remain backed up to the curb except during actual loading or unloading from it and in such case no longer than the actual loading or unloading required. The horse or horses attached to a vehicle backed up to the curb shall be turned at right angles to the vehicle and in the direction in which traffic on the street is moving.

12. Stopping at Crossings

Vehicles shall not stop on or obstruct crossings.

13. Stopping at Entrances.

No vehicle shall be allowed to stand in front of the entrance to a theatre, hotel auditorium, office building or any building where large assemblages are being held, or where goods or merchandise is taken in or out.

No vehicle shall stop so as to obstruct the entrance to any lane or driveway into private garages or into any building.

14. Parking

No horse or vehicle shall be left in such a manner as to obstruct the ordinary traffic of the streets, and no horse or vehicle shall be parked on any street an unreasonable time having regard to the traffic requirements of the street in question.

15. Parking near Intersections

No vehicle shall stand on the corners of street intersections for a distance of twenty feet back from the corner on each intersecting street, "corner" being defined as the intersecting right angle point of the curbs.

No vehicle shall stand on the corners of streets carrying street car or bus traffic for a distance of fifty feet back from the corner of each intersecting street. No vehicle shall stand on any portion of a street carrying street car or bus traffic within eighty feet of a point designated as a street car stop.

16. Parking near Hydrants

No vehicle shall stand within ten feet of a fire hydrant.

17. Parking on Bridges

No vehicle shall stand on any bridge within the municipality.

18. Manner of Parking Parallel to Curb

No vehicle shall stand on any street where there is a curb unless such vehicle is parallel to and the wheels and runners thereon are not more than six inches from such curb, or in winter, as near this as the conditions of the streets permit. On uncurbed streets standing vehicles shall be parallel to and as close as circumstances and weather conditions permit to the edge of the boulevard or sidewalk as the case may be.

19. Angle Parking

Where angle parking is indicated the angle shall be forty-five degrees and vehicles shall park with right front wheel against curb or the indicated line.

20. Parking on Narrow Streets

No vehicle shall stand or park directly opposite another vehicle which is already standing on the other side of the street, where the width of the vehicular travelled portion of the street, or the width between-curbs is less than thirty-six feet, or where such standing or parking would prevent the free passage of two lines of traffic.

21. Parking on Street Car Streets at Rush Hours

Between hours of 5 p.m. and 6.30 p.m. no vehicle shall be allowed to stand or be parked on the (north or south) and (east or west) side of a street on which street cars are operated. (Side of street will depend on direction of homeward bound traffic.)

22. Parking and Traffic Signals

It shall be the duty of all drivers of vehicles to observe traffic signals, "no parking" signs, and other permanent or semi-permanent signal devices.

23. Parking Signs

None of the provisions of this by-law respecting parking shall come into effect until suitable signs have been erected, clearly indicating the parking restrictions.

24. Through Highways

The following streets are designated as "Through Streets" and, as required by subsection 2 of section 35 of The Highway Traffic Act, the operator or driver of every vehicle shall immediately, before entering or crossing any of these streets, bring the vehicle to a full stop.

The provisions of this section shall not come into effect until signs have been erected in accordance with the regulations of the Department of Public Highways.

25. Pedestrians

Pedestrians must not step from the sidewalk in crossing a street without looking in both directions and shall cross at right angles with the street. Pedestrians shall keep to the right when walking on the sidewalk.

It shall be the duty of pedestrians to observe the line of traffic at street intersections, and in cases where policemen are in charge directing the movement of such traffic, pedestrians shall observe the signal of such policemen and they shall not cross except at their own risk before the signal is given for the traffic to move in the direction indicated by the traffic officer.

Pedestrians shall not obstruct sidewalks or street corners and where three or more persons are congregated they shall be subject to the direction of the police.

26. Penalty

Any person violating any of the provisions of this by-law shall be subject to a penalty on conviction thereof in the discretion of the convicting magistrate of not more than Ten Dollars (\$10.00) for the first offence and to not more than Twenty-five Dollars (\$25.00) for every subsequent offence exclusive of costs and all such penalties shall be recoverable under the Ontario Summary Conviction Act.

REGULATIONS RESPECTING STOP SIGNS

In pursuance of subsection 1a of section 36 of The Highway Traffic Act:

Stop signs shall conform to the standard approved by the Department of Public Highways of Ontario, with respect to size, wording, shape, colour and position.

SPECIFICATIONS FOR STOP SIGNS

Signs shall be 2 feet square, or octagonal, with the words "STOP" "THROUGH STREET" in black letters on a white background. Plain block letters 8 inches in height and $1\frac{1}{4}$ inches in thickness shall be used for the word "Stop" and letters $3\frac{1}{2}$ inches in height and $\frac{1}{2}$ inch in thickness for the words "Through Street." These words shall be printed in three lines.

LOCATION OF STOP SIGNS

"Stop" signs shall be erected not more than 6 feet back from the curb of the intersecting street, and on the right of traffic approaching a through street; not less than 15 feet nor more than 50 feet back from the curb of the "Through Street." The bottom edge of the signs shall be 7 feet above the ground level.

Report on Municipal Roads

Report upon the Work of the Municipal Roads Branch
for the Years 1926 and 1927

ROBERT C. MUIR, Chief Engineer of Municipal Roads

COUNTY ROADS

Provincial aid to counties on road improvement is given through County Road Systems under the Highway Improvement Act.



Surface treated macadam road and patched with cold mixture.

The Highway Improvement Act was initiated in 1901, when an appropriation of \$1,000,000 was made by the Provincial Government with a view to aiding the construction of county roads; the provincial subsidy being $33\frac{1}{3}$ per cent. To-day the Province contributes 50 per cent. of the expenditure made on county roads, including construction, maintenance, machinery and superintendence expenditure.

Since the passing of the Highway Improvement Act, and to the end of 1927, a total of \$79,365,551.86 has been expended on construction and maintenance of county roads, of which the Province has contributed \$35,979,647.66. This includes the county expenditure of 1927, on which the provincial subsidy was paid in 1928.

A system of county roads has been established in each of the thirty-seven counties of the Province, although there are a few instances where only the more densely populated section of a county is included in the County Road System.

At the end of 1927 the Province was paying subsidies to the counties on 7,707 miles of county roads—approximately 14.8 per cent. of the total road mileage in the area covered by the County Road System.

Approximately 94 per cent. of the road mileage under the County Road System has been surfaced with gravel or other more permanent class of material.

Expenditure on county roads in 1926 was as follows:

	Total Expenditure	Provincial Subsidy
Construction		
County roads.....	\$3,964,740 83	\$1,977,400 07
Maintenance		
County roads.....	1,873,704 29	936,260 89
Total expenditure.....	\$5,838,445 12	\$2,913,660 96

The work on which the foregoing expenditure for construction was made included the following:

Grading.....	405.02 miles
Gravel roads.....	274.74 miles
Waterbound macadam.....	81.50 "
Bituminous macadam.....	18.75 "
Cement concrete.....	11.18 "
Asphaltic concrete.....	9.42 "
Total surfaced.....	395.62 "
Bridges over 10-foot span.....	82
Concrete slab culverts.....	244
Pipe and tile culverts.....	1,543
Tile underdrains.....	19 miles

In addition, approximately 1,600 miles of stone and gravel roads were resurfaced.

Expenditure on county roads in 1927 was as follows:

	Total Expenditure	Provincial Grant
Construction		
County roads.....	\$5,154,437 09	\$2,571,706 01
Maintenance		
County roads.....	\$2,270,027 76	\$1,135,013 87
Total expenditure.....	\$7,424,464 85	\$3,706,719 88

The work on which the foregoing expenditure for construction was made included the following:

Grading.....	613.45 miles
Gravel.....	375.28 miles
Waterbound macadam.....	145.76 "
Cement concrete.....	25.73 "
Bituminous macadam.....	29.59 "
Asphaltic concrete.....	19.19 "
Total surfaced.....	602.18 "
Bridges over 10-foot span.....	87
Concrete slab culverts.....	204
Pipe and tile culverts.....	1,691
Underdrains.....	38 miles

Maintenance

The maintenance of roads is now receiving special attention of the county organizations and in many of the counties a system of maintenance patrol has been created with very gratifying results. The engineers of the Department are encouraging the counties to devote more attention to the important need of maintenance and supply ample funds to protect the investment made in previously constructed roads.

Public Safety on Highways

Many of the counties have become aware of the fact that our roads are intended for the travelling public and that every reasonable means should be used to ensure passage over them. For the purpose of giving a clearer vision at road intersections many sharp turns have been eliminated at very little cost to the county. Also, several railway crossings have been eliminated or greatly improved, brush being cut to provide a clearer vision.



Culvert should be built to the full width of grade.

Road Accounting

A uniform system of keeping road accounts has now been established in every county. The procedure of auditing the books of the county officials by the Department has been favourably received by counties. It is essential that proper records be kept of the expenditure in order to build up an efficient organization. The Province is now contributing dollar for dollar on expenditure on county roads and is, therefore, vitally interested in how the money is expended.

County Road Committee

The limiting of the size of the County Road Committee by legislation to not more than five members is greatly appreciated by the counties in general. In the majority of counties, the Committee is now of some value to the road superintendent, and in addition the expense to the county is cut down con-

siderably. It is felt, however, in many counties that a committee composed of three members is ample; in fact the most efficient road committees we have consist of three members only.

Revision of County Road System

During the year 1925 the county road mileages were revised and reduced almost 20 per cent. with the intention of placing only those roads of some importance on the County Road System. Many of the counties could not provide sufficient funds to take care of the mileage under their jurisdiction. To-day it is pleasing to know that improvement is already noticeable in some counties where a substantial reduction was made in the mileage. Counties should be encouraged to retain the mileage they have at present and improve such before seeking further extensions. The Department is not adverse to adding more mileage to the County Road System if the county can take care of such additional mileage.



Road alignment change, county of Lincoln.

County Aid to Urban Municipalities

County aid to towns and villages has now been placed on a more uniform basis by legislation and is favourably received by the municipalities. The county now assumes the cost of the central 20-foot strip of roadway through urban municipalities not separated from the county on streets which are connecting links of the County Road System. The cost of the excess width over 20 feet and other special work is borne by the urban municipality. Provisions are also made whereby the county refunds to a town 50 per cent. and to a village 75 per cent. of the amount the town or village pays into the county for country road purposes. The Province contributes 50 per cent. of the expenditure made by the county, in or to, the urban municipality.

Improved streets within urban municipalities serve the best interest of the whole community. Their benefits are neither selfish nor individual. Their usefulness is not limited to those who live within the corporation boundaries, but rather is extended to the whole surrounding territory.

That street improvements should be made by the towns and villages in agricultural communities as rapidly as possible seems only fair for such improvements direct benefits to the agricultural communities upon which so much of the prosperity of these municipalities is dependent.

Economical municipal administration, inexpensive transportation, convenience and cleanliness demand paved roadways in towns and villages. The building of trunk highways to the limits of towns creates a new demand for pavements in the urban centres which must be met. The present Government, quick to recognize the necessity of placing the improvement of those streets within the urban centres which form connecting links of the Provincial Highway or County Road Systems, made provisions in the Highway Improvement Act, whereby the Province would assist the urban municipalities in improving such streets on a larger and more uniform basis than formerly.

As a result of the Province's liberal assistance to urban centres, twenty-two urban municipalities had permanent pavements constructed at the expense of the county under the new legislation during the years 1926 and 1927. The type of pavements laid, being cement concrete, asphaltic concrete on concrete or macadam base and bituminous macadam. In addition, other urban municipalities maintained the roads with the aid of the refund from the county.

Road Conference

The Thirteenth Annual Road Conference was held on the 20th and 21st of February, 1927, and was largely attended by county and township road officials. This conference is becoming more popular each year and is creating great interest among the township road superintendents. The discussion following the addresses were interesting and brought out much valuable information. Over two hundred county and township officials attended this conference and great interest was taken throughout the entire proceedings. In addition to the annual conference, many district meetings were held during the year, arranged either by the local municipalities or by the engineers of the Department. Such meetings were well attended and matters pertaining to road improvement were discussed and much information obtained. Such meetings are very instructive and are being encouraged by the municipalities.

Among the special features of road improvement effected during the years 1926 and 1927, the following works may be mentioned:

BRANT COUNTY

In 1926 four miles of 9-foot cement concrete pavement were laid on one side of a 28-foot gravel road. This class of construction has given excellent satisfaction in this county. In 1927 five miles of road were graded to a width of 28 feet and gravelled to 18 feet in width. In addition, the county constructed the William Street bridge in the town of Paris at a cost of approximately \$38,000. The bridge is of steel design and consists of three spans, each 118 feet in length and with a 20-foot roadway and two 5-foot sidewalks. The Douglas Bridge was also constructed on a county road and consists of a steel superstructure having one span 88 feet in length and an 18-foot roadway.

BRUCE COUNTY

During 1926, in a series of sections, varying in length from 3 to 5 miles, 14 miles of gravel road 18 feet wide were constructed and road graded to a width of 26 feet. In 1927, 14.6 miles of road were graded to a width varying from 24 feet to 30 feet and 17.8 miles of road were gravelled to a width of 18 feet. Improvements over the earlier years of the system were very noticeable in this county.

CARLETON COUNTY

In 1926, one and one-half miles of bituminous macadam 16 feet wide were laid and one mile of amesite surface 12 feet wide. In addition, 12.5 miles of gravel surface 16 feet wide were laid. In 1927, two miles of bituminous macadam and one mile of asphaltic concrete 18 feet in width were constructed. In addition, approximately 16 miles of road were graded to a width varying from 24 to 28 feet. The Mohrs bridge was also built, consisting of one 80-foot span with an 18-foot roadway. The superstructure is of steel design.

DUFFERIN COUNTY

In 1926, the McPherson bridge, of concrete arch truss type, consisting of two 80-foot spans, was built by the county. In addition, 5.3 miles of gravel road were built. In 1927, twenty-six miles of road were graded to a width of approximately 24 feet, and surfaced with gravel. In addition, the McKee bridge, consisting of a 45-foot span with an 18-foot roadway, was built. The bridge is of reinforced concrete design.

ESSEX COUNTY

In 1927, seven miles of cement concrete pavement, 18 feet in width, were constructed. In addition, five bridges, varying in span from 20 feet to 90 feet, with 20-foot roadways, were constructed. Four of these bridges were of reinforced concrete design and one consisting of a 90-foot span, the superstructure of which consists of a steel truss.

GREY COUNTY

In 1926, approximately 14 miles of 16-foot gravel road were built, varying in length from three to six miles, and the road graded to a width of 26 feet. In 1927, 15.5 miles of road were graded to a width, varying from 24 feet to 30 feet, and gravelled 16 to 20 feet in width. In addition, 34 concrete slab culverts were built. Ten bridges were also constructed, varying in span from 20 feet to 146 feet. The chief item in this construction was the Thornbury bridge, which is 146 feet in length and having a clear roadway of 24 feet in width. The superstructure is of steel design.

HALDIMAND COUNTY

In 1927, approximately 26 miles of road were graded to a width varying from 24 to 28 feet.

HURON COUNTY

In 1926, sixteen miles of road were graded to a width of 28 feet and surfaced with gravel 16 to 20 feet wide, and kept in excellent shape by constant dragging. Gravel roads are constructed at low costs in this county and the work and organization are an example for other counties to follow. In addition, one 56-foot span bridge of reinforced concrete beam design was built. In 1927, 28.5 miles of road were graded to a width varying from 24 to 28 feet, and 29.75 miles of road were gravelled to a width varying from 16 to 20 feet.

KENT COUNTY

In 1926, approximately 26 miles of gravel road 16 feet wide were built in sections varying in length from 4 to 8 miles. In addition, one and one-half miles of concrete pavement 18 feet wide were laid. In 1927, approximately 24 miles of road were graded, varying from 24 to 28 feet in width.

LAMBTON COUNTY

In 1926, six-tenths of a mile of cement concrete pavement, 18 feet wide, were built on the Lake Shore road. In addition, 6.37 miles of stone and 8.45 miles of gravel roads 16 feet wide were constructed. In 1927, sixteen miles of road were graded to a width of 24 feet, and approximately five miles of road were gravelled. In addition, twenty-one concrete slab culverts were built.

LANARK COUNTY

In 1926, two and one-half miles of bituminous macadam surface, 16 feet wide, were built, and 1.26 miles of waterbound macadam. In addition, pavements, consisting of asphaltic concrete on concrete base, amesite and bituminous macadam, were built in the urban municipalities of Perth, Almonte and Lanark; also a bridge in the town of Almonte, consisting of three 100-foot spans and a 20-foot roadway, was built.

LENNOX AND ADDINGTON COUNTY

In 1926, the Mink's bridge and Millhaven bridge, of 65-foot and 42-foot span respectively, of steel superstructures, were the chief features of work carried out. In 1927, approximately eight miles of road were graded 26 feet in width, and 5.5 miles of asphaltic concrete surfaces were laid.

LINCOLN COUNTY

In 1927, 14.75 miles of road were graded to a width of 26 feet, and approximately 13 miles of waterbound macadam road were constructed. In addition, ten concrete slab culverts were built.

MIDDLESEX COUNTY

Approximately 18 miles of road were graded to a width of 26 feet and surfaced with gravel, in 1926. In addition, the Melrose bridge of steel truss superstructure, consisting of one 81-foot span, and the White bridge, consisting of two spans, one 83-foot and one 93-foot, were built. In 1927, approximately 15 miles of road were graded, varying from 24 to 28 feet in width. In addition, 6.3 miles of concrete pavement were laid, the majority of which was within urban municipalities.

NORFOLK COUNTY

In 1926, approximately 11 miles of gravel road 16 feet wide were built and the road graded to a width of 26 feet. In 1927, approximately 18 miles of road were graded, 24 feet in width, and 16 miles were gravelled.

ONTARIO COUNTY

In 1926, the chief features in this county applied to work in the villages of Cannington and Beaverton, where a pavement consisting of an asphaltic concrete surface on a cement concrete base was built under the provisions of The Highway Improvement Act.

OXFORD COUNTY

In 1926, approximately 34 miles of gravel roads 16 feet wide and two miles of waterbound macadam were built. In 1927, 4.5 miles of asphaltic concrete surface, 18 feet in width, were constructed.

PEEL COUNTY

In 1926, approximately 12 miles of gravel roads 14 feet wide were built and the road graded to a width of 26 feet. In 1927, approximately 21 miles of road were graded, 26 feet in width, and 19 miles were gravelled to a width of 18 feet.

PERTH COUNTY

In 1927, approximately 39 miles of road were graded 26 feet in width, and gravelled 20 feet in width.

PRINCE EDWARD COUNTY

In 1926, five and one-half miles of road were graded to a width of 24 feet and surfaced with waterbound macadam. In addition, 64 miles of macadam road were surface treated with asphalt and stone chippings. In 1927, 2.75 miles of bituminous macadam surface were constructed.

RENFREW COUNTY

In 1926, three and one-half miles of road were graded to a width of 26 feet and gravelled for a width of 16 feet. This includes a heavy sidefill grading on the Lake Doré Shore road and construction of guard-rails. In addition, three steel bridges were built one 78-foot span, one 54-foot span, and one 44-foot span.

SIMCOE COUNTY

In 1926, approximately 18 miles of gravel road 16 feet wide were built and graded to a width of 26 feet. In addition, the county contributed towards the cost of constructing an asphaltic concrete pavement within the town of Midland. In 1927, approximately twenty miles of road were graded, 26 feet in width, and gravelled 18 feet in width.

UNITED COUNTIES OF STORMONT, DUNDAS AND GLENGARRY

In 1926, fourteen miles of stone roads 14 feet wide were built, and graded to a width of 24 and 26 feet; also one mile of bituminous macadam surface, 16 feet wide.

VICTORIA COUNTY

In 1926, approximately six miles of road were graded to a width of 26 feet, and 3.87 miles of waterbound macadam road were built. In addition, one-half mile of asphaltic concrete surface on concrete base, 18 feet wide, was built, and one-third of a mile of bituminous macadam. In 1927, approximately ten miles of road were graded 26 feet in width, and two miles of asphaltic concrete surface were laid.

WATERLOO COUNTY

In 1926, approximately two miles of concrete pavement 18 feet wide were built, and 6.75 miles of gravel road. In addition, the county contributed towards work in the town of Preston. In 1927, approximately twelve miles of road were graded to a width of 24 feet, and approximately five miles of cement concrete pavement were built.

WELLAND COUNTY

In 1927, approximately eight miles of road were graded to a width of 26 feet, and four and one-half miles of bituminous macadam surface were laid. In addition, twelve concrete slab culverts were built.

WELLINGTON COUNTY

In 1927, approximately 17 miles of road were graded to a width of 28 feet, and 12.5 miles were gravelled 18 feet in width. In addition, 2.2 miles of cement concrete and two miles of bituminous macadam surfacing were built.

WENTWORTH COUNTY

In 1926, approximately twelve miles of waterbound macadam road were built and 2.50 miles of gravel road. In 1927, approximately sixteen miles of road were graded to a width of 24 feet, and eleven and one-half miles of waterbound macadam road were built. In addition, three miles of cement concrete and eight and one-half miles of bituminous macadam were built.

YORK COUNTY

In 1927, approximately twenty-three miles of road were graded to a width of 28 feet, and sixteen miles gravelled 20 feet in width. In addition, approximately fifteen miles of waterbound macadam road, eight and one-half miles of bituminous macadam, and 1.75 miles of asphaltic concrete surfaces were built.

GENERAL

The work in the remaining counties and other work of the above-named counties consisted chiefly in reshaping and maintaining the existing road, building concrete slab culverts, laying pipe culverts and otherwise preparing for future work.

COUNTY SUBURBAN ROADS

Provision is made under The Highway Improvement Act whereby a city or separated town may co-operate with the county council in improving the leading county roads adjacent to the city or separated town and thereby obtaining a more substantial type of construction for such suburban road.

The section of county road designated as "Suburban" remains a county road, for which the county is responsible; the work of construction and maintenance is carried on under the direction of an engineer, appointed by the Suburban Road Commission, or may be carried on under the direction of the County Road Superintendent, but subject to the instructions of the Commission.

At the end of 1927, twenty-two cities, all the cities within the organized counties, and three separated towns, Smith's Falls, Walkerville and Brockville, were paying towards the improvement of county suburban roads. The Commissions appointed have assumed 693.6 miles of road, the expenditure on which at the end of 1927 amounted to \$13,748,323.48, of which the cities and separated towns have contributed \$3,684,939.50, or 4.64 per cent. of the total expenditure made on the County Road Systems.

Towards the expenditure on construction and maintenance and supervision of county suburban roads, the Province contributes 50 per cent., and the county and city each 25 per cent. The object of a city's contribution is not to relieve the county of the expenditure which they are equitably called upon to make, but rather to improve the standard of roads radiating from the city, and to permit them to be maintained in a condition suited to the traffic over them. Traffic accumulates on the main roads immediately adjacent to the city, and it becomes an unfair charge upon rural districts to construct and maintain roads suited to such accumulated traffic.

In 1926, the expenditure on county suburban roads was \$1,312,710.23, of which the Province contributed \$656,134.16, and counties and cities each \$328,288.04. In 1927, the expenditure was \$1,508,141.56, of which the Province contributed \$754,070.81, and counties and cities each \$377,035.37.

During the years 1926 and 1927, the Suburban Road Commissions constructed 51.55 miles of permanent surfaces.

GENERAL

The work on county roads and county suburban roads has shown remarkable improvement during the past few years, and the counties and commissions in the majority of instances are to be commended on the method of carrying on the work.

The construction of permanent pavement structures on suburban roads in the close vicinity of the city should be encouraged by all Suburban Road Commissions.

In fairness to those counties which have endeavoured to meet the traffic requirements of the day and to provide an organization suitable to take care of such conditions, it may be said that one or two counties have not seen fit to create an organization capable of handling the situation as it presents itself to modern requirements. It is expected, however, with encouragement from the Department that conditions will change in these backward counties.

INDIAN RESERVES

Provincial aid towards road improvement in Indian Reserves is provided by Sections 35 and 45 of The Highway Improvement Act. Section 35 provides that where a road in the reserve is a connecting link of the county road system, the Province will contribute 50 per cent. of the expenditure made on such connecting link. The purpose of this assistance is to establish uniformity of improvement throughout the county road system, as there are cases where these roads within the reserve are used extensively by through or foreign traffic. On other roads (Section 45) within the reserve, the Province contributes 30 per cent. on expenditure made thereon, such roads being placed in the same class as township roads.

During the year 1926, the Reserves of Kettle and Stoney Point, Walpole Island, Caradoc, Sarnia, and Saugeen received provincial aid on a 50 per cent. basis. These reserves expended \$7,650.39, of which the Province paid \$3,825.20. In 1927, the Reserves of Kettle and Stoney Point, Walpole Island, Sarnia, Six Nations, and Caradoc expended \$11,154.39 on roads, of which the Province contributed \$5,577.20.

In 1926, on a township or 30 per cent. basis, the Reserves of Cape Croker, Moravian and Six Nations expended \$30,097.21, towards which the Province contributed \$9,210.22. In 1927, the Reserves of Cape Croker, Moravian, Sarnia, and Six Nations expended \$34,480.69 on roads, of which the Province contributed \$11,133.22.

The work within reserves consisted chiefly of grading and gravelling and the work in the majority of cases is to be commended.

TOWNSHIP ROADS

The township road plays a most important part in the development of this Province and the improvement of such roads are being encouraged by the present administration.



Typical Township Road.

Our township roads, in the early history of the Province, depended largely on statute labour for improvement, this system having been created by the first parliament of the Province (then Upper Canada) in 1796. In the old days, when traffic moved slowly on a narrow strip of gravel, statute labour served its purpose, but with the advent of the motor car it has become obsolete as a road-builder. Statute labour still holds in a few localities but is growing weaker. Money expenditure, raised by general levy on the township assessment, has been steadily increasing, and at the end of 1927, three hundred and seven townships had abolished statute labour, being approximately 80 per cent. of the townships in the organized counties.

There are 376 townships within the area covered by the County Road System with a road mileage of approximately 42,148 miles under the control of



Before.

the township councils. At the end of 1927, approximately 21,700 miles had been surfaced with gravel or stone or other more permanent type of surface.

The total approved expenditure in 1927, of the 307 townships receiving aid under The Highway Improvement Act, amounted to \$5,204,574.49. Subsidies amounting to \$1,619,169.74 were paid, being 30 per cent. of the cost of construction, maintenance, bridges, machinery, and 50 per cent. of the cost of superintendence. Apart from the actual financial assistance, the advice and co-operation of the engineers of the Department have been of untold value to the townships and are having a marked effect upon the nature of township road improvement throughout the Province. In bridge and culvert construction, in the elimination of dangerous curves, brush obstructions, narrow fills, and like matters, the impetus towards prompt action and the advice and guidance in the matter of methods and costs have been found to be sound and worthy of adoption.

In 1926, 163 bridges and 309 concrete slab culverts were built by the townships and numerous pipe culverts laid. In 1927, 132 bridges and 211 concrete slab culverts were built. Yearly the mileage of earth roads is diminishing, gravel, stone or other more substantial surface being employed to provide the farmer with a safe and convenient road in seasons of the year when he needs it most. As in other years, work on township roads consisted chiefly of renewing worn-out surfaces and keeping them smooth by frequent dragging—that is, expenditures were largely for maintenance, narrow grades are being widened out, swampy stretches cleared and drained, and effective watercourses established along roadsides to ensure a reliable road surface in all weathers.

The main objective of every township council should be to provide the farmer with a safe and convenient road in seasons of the year when he needs it most.



After

The following shows the growth of provincial aid to townships on road improvements, under the provisions of The Highway Improvement Act:—

1916.....				\$1,241	71	towards superintendent's salary
1917.....				1,608	72	“ “ “
1918.....				1,910	59	“ “ “
1919.....				2,620	60	“ “ “
1920 (184 townships).....				340,973	38	Commencement of aid on improvement.
1921 (294 “).....				708,486	91	
1922 (312 “).....				649,601	48	
1923 (315 “).....				614,037	88	
1924 (320 “).....				638,940	11	
1925 (272 “).....				988,633	29	
1926 (295 “).....				1,317,146	17	
1927 (307 “).....				1,619,169	74	
Total.....				\$6,884,370	58	

Standard of Work

The class or standard of work to be done on municipal roads (county and township) will be governed largely by the importance of the road. The amount of traffic using the road will decide as to the amount of expenditure and the type of construction required on the work.

Engineers of the Department

The Department's engineers have now been established within the area allotted to them for the purpose of being in closer touch with the work and for lending their services to the municipal officials to the best advantage. The Department desires to assist and co-operate to the fullest extent with the municipalities in the improvement of roads, and requests that the superintendents communicate with the district engineers of the Department before any permanent work is commenced. The engineers of the Department are at the services of the municipalities at all times in all matters pertaining to road improvement.

APPENDICES

Nos. 1 to 14

APPENDIX
DETAILS OF CONSTRUCTION—

County	Bit. Mixed Method	Culverts Built	Bridges Built	Miles of Grading	Miles of Gravel- ling
Brant.....					29.40
Bruce.....					3.5
Carleton.....	7.2		1 extended	8	16.4
Dufferin.....		1			13.08
Dundas, Stormont and Glengarry.....					2.25
Durham and Northumberland.....					
Elgin.....		6	1		
Essex.....		2		8.6	8.6
Frontenac.....		1		9.75	33.75
Grey.....					
Haldimand.....					
Halton.....					
Hastings.....					.8
Huron.....		1			
Kent.....		1			
Lambton.....					
Lanark.....	5.3	21		11.4	11.4
Leeds and Grenville.....					
Lennox and Addington.....		1		10.4	
Lincoln.....			1	0.3	0.3
Middlesex.....					27.76
Norfolk.....				0.6	0.6
Ontario.....		1 extended	1	.035	13.5
Oxford.....					
Peel.....					
Perth.....					
Peterborough.....					
Prince Edward.....			*Spans 3 and 4		
Renfrew.....				3.7	6.5
Russell and Prescott.....		2	1 (not completed)	5.0	2.0
Simcoe.....	2.73				
Victoria.....					5.19
Waterloo.....			1	.50	
Welland.....		1			
Wellington.....		4 and 3 ext.		1.5	25.5
Wentworth.....		1	2	.6	4.5
York.....					

*Belleville Bay Bridge.

No. 1

PROVINCIAL HIGHWAYS, 1926

Miles W.B. 2 Course Macadam	Miles Bit. Pene- tration	Miles Asp. Concrete	Miles Concrete Pave- ment	Lin. Ft. Guard Rail	Lin. Ft. Storm Sewers	Miles Surface Treat- ment	Miles Gravel Road Maint.	Miles New Fence Erected
				50	140			
2				2,100	500	.8	37.5	
5.6	.5			106		13.4	52.4	2.7
				930		24.2	20.8	
5.21	3.5		28.47	3,166		5.21	23.31	
			1.5	3,020			37.1	2.42
			12.39	4,620	4,524	3.84	7.03	
	2.3			145		16.8	8.6	
				3,946		3.5	73.40	
	1.5			3,000		30.7		
	4.0						6.0	
				325		24.35		
			5.59	250			29.7	
			8.6	1,617		9.3	49.48	
							26.50	
				1,460		21.6		
	17.7			1,455			62.9	6.0
						16.45	.32	
5.32		5.0	0.7	7,050			40.43	2.2
	4.5			2,000			21.4	1.7
			3.42	3,493			31.16	
	0.3			4,600	250		1.0	3.5
6.00	7.3		0.3	950			27.85	00.4
			7.78	100		5.4	12.40	
						4.0		
3.53				3,225		17.05		
	3.4			1,200		2.4	53.8	
	5.5			650			11.2	.5
2.0							32.37	
			1.15				12.69	
				1,820			8.82	
		6.5		1,200		8.5		
			7.54	1,116		17.6	50.7	0.36
			1	2,700	351	5	5	
				68				

APPENDIX
DETAILS OF CONSTRUCTION—

County	Bit. Mixed Method	Culverts Built	Bridges Built	Miles of Grading	Miles of Gravel- ling
Brant.....				.2	
Bruce.....				100'	
Carleton.....					2.3
Dufferin.....					
Dundas, Stormont and Glengarry	9.55	2 ext.	1		
Durham and Northumberland...	3.76		1		
Elgin.....				.5	
Essex.....					
Frontenac.....		1			
Grey.....		1 (pipe)		7.6	19.65
Haldimand.....			1		
Halton.....					
Hastings.....					
Huron.....					
Kent.....		3		1	43.9
Lambton.....					48.6
Lanark.....		1			
Leeds and Grenville.....	15.04	18		15	65.5
Lennox and Addington.....					
Lincoln.....					
Middlesex.....	1.3	3 Conc. 2 Ext. 18 Iron Pipe		5.8	
Norfolk.....					9.0
Ontario.....					
Oxford.....				.1	
Peel.....		1		1.1	1.4
Perth.....		1 conc. ext.			
Peterborough.....	5.71			110'	.125
Prince Edward.....			9 spans, Belle- ville Bay Bridge		
Renfrew.....		18 and 8 ext.	1	9.1	9.1
Russell and Prescott.....		23 and 2 ext. 3 pipes cased	1 1 ext.		
Simcoe.....		2		9.0	
Victoria.....	.24				
Waterloo.....					
Welland.....		12 and 15 ext.		22.3	
Wellington.....		2 Pipe 5 Conc. 9 Conc. ext. 2 and 2 ext.	1		8.9
Wentworth.....				5.0	
York.....				4.7	

No. 2

PROVINCIAL HIGHWAYS, 1927

Miles W.B. 2 Course Macadam	Miles Bit. Pene- tration	Miles Asp. Concrete	Miles Concrete Pave- ment	Lin. Ft. Guard Rail	Lin. Ft. Storm Sewers	Miles Surface Treat- ment	Miles Gravel Road Maint.	Miles New Fence Erected
10.75	1.2		.15				5.30	
			.43	472		1.2	30.40	
0.2			5.3	8,880		9.2	45.86	76'
0.8	1.1		6.9			6	15.4	
				22,600		56.3		
			5.93	6,154		5.21	10.47	.25
			12.77	6,280	7,886		24.9	4.5
			7.06	2,240		3.84		
9.0						17.4		
				13,648		49.45	89.20	6.1
	.68							
	3.4		3.2	725		8.6	8.1	
				1,001				
			7.51				31.41	
			10.48	10,685	865	9.55	43.9	
			10.59	4,950			48.6	
				6,200		18.8	12.56	
	1.5			4,900		7.0	49.3	5.5
				3,721			.32	
	5.32		10.2	15,840	42,140	24.5	55.4	1
			7.68	1,560		12.86	9.0	
			.15	1,000			38.05	
	5.2			850			.9	.1
							21.22	1.55
		400'	1.92					
				100			39.56	
						20.96	7.16	
	3.0			7,240		1.5	67.42	18.2
	20.05			5,556	9,000		11.2	.68
		9.83				19.60	61.50	
						3.85	22.47	
			6.5				11.50	
				1,200		8.2		1.1
			3.62	4,278		6	42.49	0.9
1.4			.62	3,825	740	8.5		1.5
	0.36	3.25	2.00	46		6.94	7.18	2.0

IMPROVEMENT IN ONTARIO FOR 1926 AND 1927

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1927	679,930	89	113,222	48	793,153	37	634,522	70	158,630	67
1926	1,164	29	15,657	75	16,822	04	13,457	64	3,364	40
1927	885	73	10,604	63	11,490	36	9,192	29	2,988	07
1926	1,677	44	34,297	21	35,974	65	26,021	78	7,194	93
1927	6,697	72	51,450	89	58,148	61	42,653	97	11,629	72
1926	271,017	06	37,143	77	309,160	83	239,839	69	61,632	17
1927	424,537	68	60,984	64	485,522	32	382,628	32	97,104	47
1926	136,945	17	20,852	55	157,797	72	126,238	17	31,559	55
1927	405,386	11	34,845	08	440,231	19	351,698	39	86,099	97
1926	86,118	49	31,174	67	117,293	16	92,512	00	23,458	63
1927	193,707	11	70,340	63	264,047	74	208,337	88	52,809	54
1926	34,305	14	9,239	75	43,544	89	34,639	60	8,708	97
1927	9,842	20	17,574	42	27,416	62	21,384	57	5,483	32
1926	320,232	60	31,537	11	351,769	71	268,393	51	70,353	94
1927	88,284	46	45,424	95	133,709	41	102,436	94	26,741	88
1926	170,500	07	13,678	84	184,178	91	146,984	10	36,835	78
1927	51,110	31	32,627	87	83,738	18	65,805	73	16,747	64
1926	18	10	5,714	03	5,732	13	3,875	91	1,146	42
1927	239,917	85	8,639	83	248,557	68	162,790	52	49,711	53
1926	128,017	18	20,819	19	148,836	37	102,876	35	29,767	27
1927	143,959	63	30,056	06	174,015	69	110,287	65	34,803	13
1926	90,762	43	29,282	27	120,044	70	96,035	76	24,008	94
1927	154,762	10	45,515	74	200,277	84	160,222	27	40,055	57
1926	199,219	72	37,801	13	237,020	85	189,616	68	47,404	17
1927	626,550	75	38,050	65	664,601	40	531,681	12	132,920	28
1926	110,844	71	72,037	84	182,882	55	146,306	04	36,576	51
1927	305,206	30	128,735	24	433,941	54	347,153	23	86,788	31
1926	30,694	80	6,919	49	37,614	29	30,091	44	7,522	85
1927	7	98	15,470	71	22,779	63	18,223	71	4,555	92
1926	19,746	19	10,371	78	30,117	97	20,593	47	6,023	59
1927	208,160	87	15,352	33	223,513	20	160,381	27	44,702	64
1926	216,074	75	21,018	20	237,092	95	159,933	38	47,418	59
1927	60,101	81	58,294	34	118,396	15	93,304	65	23,679	23
1926	183,591	19	53,254	04	236,845	23	188,161	98	47,369	04
1927	143,524	18	61,501	48	205,025	66	163,054	27	41,005	13
1926	80,462	04	58,508	21	138,970	25	89,908	07	27,794	05
1927	106,337	06	67,588	42	173,925	48	118,740	68	34,785	09
1926	35,114	48	41,979	38	77,093	86	49,415	30	15,418	77
1927	166,363	60	44,761	54	211,125	14	124,232	01	42,225	03
1926	284	21	2,947	79	3,232	00	2,585	60	646	40
1927	* 151	83	4,893	83	5,045	66	4,036	53	1,009	13
.....	12,129,892	97	2,846,589	22	14,976,482	19	11,654,653	59	2,990,577	21
Total	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

APPENDIX No. 4

EXPENDITURE ON PROVINCIAL SUBURBAN AREAS, 1926 AND 1927

City	Year	Construction	Maintenance	Total Expenditure	Proportion paid by Cities
		\$ c.	\$ c.	\$ c.	\$ c.
Belleville.....	1926	77,082 81	7,702 66	84,785 47	16,957 09
	1927	138,915 05	7,885 64	146,800 69	29,360 13
Brantford.....	1926	118 06	4,418 32	4,536 38	907 28
	1927	125 51	6,694 80	6,820 31	1,364 06
Chatham.....	1926	25,585 12	2,770 93	28,356 05	5,671 21
	1927	2,703 37	2,329 86	5,033 23	1,006 64
Galt.....	1926	.....	641 98	641 98	128 40
	1927	.....	486 70	486 70	97 34
Guelph.....	1926	197 98	6,373 06	6,571 04	1,314 21
	1927	53 90	4,777 43	4,831 33	966 26
Hamilton.....	1926	57,114 22	49,226 42	106,340 64	21,268 13
	1927	57,098 06	44,900 53	101,998 59	20,399 71
Kingston.....	1926	30,233 05	11,021 23	41,254 28	8,250 86
	1927	2,138 47	7,182 36	9,320 83	1,864 17
Kitchener.....	1926	13,032 38	3,830 16	16,862 54	3,372 51
	1927	89,066 10	2,593 63	91,659 73	18,331 95
London.....	1926	26,241 75	7,203 10	33,444 85	6,688 97
	1927	19,035 71	9,911 92	28,947 63	5,789 53
Niagara Falls.....	1926	Cr. 7,591 10	4,564 05	Cr. 3,027 05	Cr. 605 41
	1927	267 14	4,302 29	4,569 43	913 89
Ottawa.....	1926	12,895 06	20,672 50	33,567 56	6,713 51
	1927	4,922 97	24,130 31	29,053 28	5,810 66
Owen Sound.....	1926	.....	4,295 87	4,295 87	859 17
	1927	13 00	778 67	791 67	158 33
Peterborough.....	1926	Cr. 1 90	3,550 90	3,549 00	709 80
	1927	174,681 04	5,597 10	180,278 14	36,055 63
Sarnia.....	1926	.....	348 70	348 70	69 74
	1927	157 67	1,605 32	1,762 99	352 59
St. Catharines.....	1926	109 84	13,679 84	13,789 68	2,757 94
	1927	1,243 53	18,081 05	19,324 58	3,864 92
St. Thomas.....	1926	1,256 32	3,407 15	4,663 47	932 69
	1927	31,137 88	4,527 97	35,665 85	7,133 17
Stratford.....	1926	.....	1,795 16	1,795 16	359 03
	1927	4,928 65	995 41	5,924 06	1,184 81
Toronto.....	1926	77,316 96	70,249 81	147,566 77	29,513 35
	1927	171,763 89	92,133 68	263,897 57	52,779 51
Welland.....	1926	147,859 82	3,872 13	151,731 95	30,346 39
	1927	291 87	2,200 07	2,491 94	498 38
Windsor.....	1926	1,398 97	3,523 17	4,922 14	984 43
	1927	6,607 22	4,664 97	11,272 19	2,254 44
Woodstock.....	1926	156 43	825 19	981 62	196 32
	1927	27 49	2,716 18	2,743 67	548 73
Total.....	....	1,168,184 29	472,468 22	1,640,652 51	328,130 47

EXPENDITURE ON PROVINCIAL HIGHWAY CONNECTING LINKS IN SEPARATED TOWNS, 1926 AND 1927

Town	Year	Construction	Maintenance	Total Expenditure	Proportion Paid by Towns
		\$ c.	\$ c.	\$ c.	\$ c.
Morrisburg.....	1927	5,581 88	.....	5,581 88	1,395 47
Delhi.....	1927	9,731 31	.....	9,731 31	2,432 83
Total.....	....	15,313 19	.....	15,313 19	3,828 30

APPENDIX No. 5

BRIDGES COMPLETED ON PROVINCIAL HIGHWAYS DURING 1926 AND 1927

Name	Span	Com- pleted	Road No.	Township	County
Freeport, concrete truss.	ft. in. 502 4 (7 spans)	1926	8	Waterloo.....	Waterloo
Jantzen's Creek (ext.), concrete B. and S.	36 2	1926	7	Waterloo.....	Waterloo.
Dredge Cut, concrete B. and S.	210 8 (4 spans)	1926	2	Raleigh.....	Kent
Tremblay Creek (ext.).....	32 11	1926	2	Tilbury N.....	Essex
Dundas, concrete B. & S.	36 0	1926	8	Town of Dundas.	Wentworth
Little Rideau (ext.).....	32 1½	1926	17	Hawkesbury E...	Prescott
Cooksville Subway.....	48 4½	1926	10	Toronto.....	Peel
Delhi, concrete truss.	104 8	1927	3	Middleton.....	Norfolk
Plantagenet No. 1, concrete truss.	236 8 (2 spans)	1927	17	Plantagenet.....	Prescott
Plantagenet No. 2, concrete B. and S.	34 0	1927	17	Plantagenet.....	Prescott
Windermere Cut-off, steel truss.	82 0	1927	8A	Saltfleet.....	Wentworth
Caledonia, concrete truss.	653 4 (9 spans)	1927	6	Seneca.....	Haldimand
Belleville Bay, steel truss.	210 5 2 spans	1927	14	Ameliasburg....	Prince Edward
Snake River, steel truss.	82 0	1927	17	Westmeath.....	Renfrew
Nash Creek, concrete truss.	51 0	1927	2	Williamsburg....	Dundas
Carp (ext.), concrete B. and S.	44 6	1927	17	Huntley.....	Carleton
La Fontaine (ext.).....	38 1½	1927	17	Clarence.....	Russell

APPENDIX No. 6

SCHEDULE OF ASSUMPTIONS AND REVERSIONS OF SECTIONS OF THE PROVINCIAL HIGHWAY SYSTEM FOR THE YEARS 1926 AND 1927

During the two years the system was extended by assuming 535.29 miles (see map, page 62), less 25.38 miles reverted, making a total assumed of 2,371.21 miles as shown on map, page 12. A list of the roads added to the system, together with the mileage and data of designation, also list of roads and mileage reverted from the system, is as follows:—

Provincial Highways Assumed in 1926

County	Date of Designation	Municipality	Mileage	Total Mileage
Carleton.....	14th of April, 1926.....	Nepean.....	2.50	2.50
Prince Edward.....	30th of June, 1926.....	Sophasburg.....	0.24	
	30th of June, 1926.....	Ameliasburg.....	0.41	0.65
Renfrew.....	14th of April, 1926.....	McNab.....	0.45	
	19th of May, 1926.....	Pembroke.....	0.60	
	19th of May, 1926.....	Westmeath.....	10.70	
	19th of May, 1926.....	Ross.....	2.20	
	15th of December, 1926....	Arnprior Town.....	0.73	14.68
				17.83

Provincial Highways Assumed in 1927

County	Date of Designation	Municipality	Mileage	Total Mileage
Brant.....	2nd of July, 1927.....	Dumfries South.....	5.33	
	2nd of July, 1927.....	Brantford.....	5.85	
		Oakland.....	3.65	14.83
Bruce.....	22nd of June, 1927.....	Brant.....	5.31	5.31
Dundas.....	2nd of July, 1927.....	Williamsburg.....	9.64	
		Winchester.....	6.53	
		Mountain.....	4.04	20.21
Grenville.....	30th of March, 1927.....	Kemptville Village.....	0.04	0.04
Grey.....	22nd of June, 1927.....	Bentinck.....	9.53	
	2nd of July, 1927.....	Sydenham.....	9.88	
		St. Vincent.....	9.95	
		Collingwood.....	10.37	39.73

Provincial Highways Assumed in 1927—Continued.

County	Date of Designation	Municipality	Mileage	Total Mileage
Haldimand.....	13th of April, 1927.....	Caledonia Village.....	0.86	
	11th of May, 1927.....	Walpole.....	1.61	2.47
Halton.....	13th of July, 1927.....	Trafalgar.....	7.95	7.95
Huron.....	14th of September, 1927.....	Stephen.....	2.48	
		Usborne.....	3.69	
		Hay.....	3.75	
		Tuckersmith.....	6.6	
		Stanley.....	4.7	21.22
Kent.....	1st of June, 1927.....	Howard.....	12.94	
		Camden.....	11.7	
		Zone.....	0.3	
		Chatham.....	0.94	25.88
Lambton.....	25th of May, 1927.....	Dawn.....	11.75	
		Enniskillen.....	8.87	
		Plympton.....	2.39	
Lanark.....	13th of July, 1927.....	Warwick.....	7.97	30.98
	17th of August, 1927.....	Ramsey.....	10.18	
		Packenham.....	10.92	
		Beckwith.....	0.05	21.15
Leeds.....	11th of May, 1927.....	Elizabethtown.....	13.58	
		Yonge.....	0.92	
		Kitley.....	10.29	
		Elmsley South.....	3.78	28.57
Middlesex.....	14th of September, 1927.....	Biddulph.....	8.04	
	2nd of July, 1927.....	McGillivray.....	2.54	
		London.....	6.1	
		Lobo.....	8.08	
		Caradoc.....	2.17	
		Adelaide.....	8.78	35.71
Norfolk.....	14th of December, 1927.....	Delhi Village.....	0.38	
	11th of May, 1927.....	Woodhouse.....	6.09	
	2nd of July, 1927.....	Townsend.....	10.63	
		Windham.....	1.0	
	26th of October, 1927.....	Town of Simcoe.....	0.35	18.45
Ontario.....	2nd of July, 1927.....	Pickering.....	9.35	
		Whitby.....	2.87	
	17th of August, 1927.....	Brock.....	6.28	
		Thorah.....	2.66	
		Mara.....	15.34	
	28th of December, 1927.....	Thorah.....	6.78	
		Brock.....	0.68	43.96
Peel.....	2nd of July, 1927.....	Toronto Gore.....	3.4	
		Chingacousy.....	4.27	7.67
Perth.....	22nd of June, 1927.....	Logan.....	9.7	
		Elma.....	12.05	
		Wallace.....	9.22	30.97
Peterborough.....	22nd of June, 1927.....	Smith.....	7.16	7.16
Simcoe.....	2nd of July, 1927.....	Vespra.....	10.96	
		Flos.....	4.75	
		Sunnidale.....	6.47	
		Nottawasaga.....	8.07	
	14th of September, 1927.....	Tiny.....	8.79	
		Tay.....	4.45	
		Flos.....	11.45	
		Vespra.....	4.7	59.64
Victoria.....	22nd of June, 1927.....	Emily.....	6.99	
		Ops.....	8.69	15.68
Waterloo.....	2nd of July, 1927.....	Waterloo.....	4.79	
		Dumfries North.....	6.31	11.10
Welland.....	11th of May, 1927.....	Wainfleet.....	8.4	
		Humberstone.....	7.61	
		Bertie.....	9.86	25.87
Wellington.....	22nd of June, 1927.....	Minto.....	2.11	
	14th of December, 1927.....	Rockwood Village.....	0.36	
	2nd of July, 1927.....	Guelph.....	4.69	7.16
Wentworth.....	25th of May, 1927.....	Beverley.....	1.48	
		Flamboro West.....	6.52	
	5th of October, 1927.....	Saltfleet.....	2.40	10.40

Provincial Highways Assumed in 1927—Continued.

County	Date of Designation	Municipality	Mileage	Total Mileage
York.....	2nd of July, 1927.....	Markham.....	13.18	
		Vaughan.....	10.88	
	17th of August, 1927.....	Town of Aurora.....	0.40	
	26th of January, 1927.....	Scarborough.....	0.89	25.35
				517.46

Reversions from January 1st, 1926, to December 31st, 1926

County	Municipality	Year	Mileage	Total Mileage
Essex.....	Windsor City.....	1926.....	0.24	0.24
Hastings.....	Belleville City.....	1926.....	0.56	
	Trenton Town.....	1926.....	0.29	0.85
Leeds.....	Gananoque Town.....	1926.....	1.60	1.60
Prince Edward.....	Sophiasburg.....	1926.....	0.36	
	Ameliasburg.....	1926.....	0.83	
	Ameliasburg.....	1926.....	0.34	1.53
Renfrew.....	Pembroke.....	1926.....	1.00	
	Westmeath.....	1926.....	12.00	
	Ross.....	1926.....	6.00	19.00
				23.22

Reversions from January 1st, 1927, to December 31st, 1927

County	Municipality	Year	Mileage	Total Mileage
Norfolk.....	Delhi Village.....	1927.....	0.42	0.42
Prescott.....	Plantagenet.....	1927.....	0.25	0.25
Wellington.....	Rockwood Village.....	1927.....	0.30	0.30
Wentworth.....	Flamboro East.....	1927.....	0.66	0.66
York.....	Scarborough.....	1927.....	0.53	0.53
				2.16

APPENDIX No. 7

GROWTH OF COUNTY ROAD EXPENDITURES AND PROVINCIAL GRANTS

Year work was done	Number of Counties	Expenditure	Government Grant
1903.....	4	\$166,149 06	\$55,383 02
1904.....	7	291,085 42	97,028 48
1905.....	7	179,593 62	59,864 53
1906.....	10	247,102 37	82,367 45
1907.....	14	383,518 86	127,839 62
1908.....	15	429,393 57	143,131 16
1909.....	16	440,374 08	146,791 36
1910.....	17	553,312 61	184,437 54
1911.....	19	712,072 52	237,357 50
1912.....	20	898,631 18	299,543 69
1913.....	20	847,684 15	282,561 35
1914.....	20	785,521 93	261,840 61
1915.....	20	811,540 05	270,513 34
1916.....	23	955,447 19	327,663 76
1917.....	32	1,388,341 87	483,621 32
1918.....	36	2,226,899 70	815,440 01
1919.....	37	5,714,937 19	2,623,719 24
1920.....	37	7,956,863 72	3,626,418 08
1921.....	37	11,078,288 39	5,119,882 26
1922.....	37	9,162,491 79	4,258,339 83
1923.....	37	7,403,509 96	3,418,523 07
1924.....	37	6,861,451 62	3,214,321 50
1925.....	37	6,608,431 04	3,222,678 10
1926.....	37	5,838,445 12	2,913,660 96
1927.....	37	7,424,464 85	3,706,719 88
Totals to date.....	..	\$79,365,551 86	\$35,979,647 66

APPENDIX No. 8

COUNTY ROAD MILEAGE AND EXPENDITURE

From Inception of County Road Systems up to December 31st, 1927
Provincial Subsidies on 1927 Expenditure being paid in 1928

County	Year of Estab- lish- ment of System	Road Mileages			Total Approved Expenditure to end of 1927	Total Government Grant
		County Roads	County Sub- urban Roads	Total		
Brant.....	1917	61.8	25.0	86.8	\$1,525,029 57	\$754,280 64
Bruce.....	1917	302.5	.....	302.5	1,744,826 20	862,392 38
Carleton.....	1909	137.0	84.0	221.0	4,963,128 22	2,274,486 42
Dufferin.....	1918	160.0	.....	160.0	817,840 66	374,557 65
Elgin.....	1917	212.2	16.3	228.5	1,562,537 35	705,554 28
Essex.....	1916	191.0	41.0	232.0	3,499,313 53	1,694,045 04
Frontenac.....	1907	112.5	36.5	149.0	959,010 10	413,496 03
Grey.....	1918	181.5	44.0	225.5	2,156,981 77	1,055,614 04
Haldimand.....	1911	126.5	.....	126.5	1,518,114 71	657,914 64
Halton.....	1907	111.0	.....	111.0	1,596,876 48	702,492 85
Hastings.....	1904	375.1	4.9	380.0	2,124,819 07	935,268 99
Huron.....	1917	344.0	.....	344.0	1,671,752 00	772,610 73
Kent.....	1917	223.2	12.0	235.2	2,576,047 14	1,284,474 27
Lambton.....	1918	233.5	11.0	244.5	1,573,431 69	737,718 22
Lanark.....	1903	199.5	6.5	206.0	1,893,800 08	868,986 30
Leeds and Grenville.....	1910	275.3	5.4	280.7	1,894,471 15	800,528 24
Lennox and Addington.....	1906	140.0	.....	140.0	1,112,654 59	511,003 00
Lincoln.....	1904	136.3	9.7	146.0	2,831,715 37	1,152,670 83
Middlesex.....	1906	356.5	28.0	384.5	2,506,983 15	1,069,181 37
Norfolk.....	1917	200.3	.....	200.3	1,830,923 36	829,788 49
Northumberland and Durham.....	1918	269.0	.....	269.0	1,084,389 28	513,908 94
Ontario.....	1918	162.5	9.0	171.5	1,013,961 61	473,346 78
Oxford.....	1904-7	213.5	7.5	221.0	1,885,332 01	769,967 72
Peel.....	1906	123.1	.....	123.1	1,581,499 21	652,631 71
Perth.....	1907	137.8	9.0	146.8	1,054,115 29	442,097 78
Peterborough.....	1919	129.7	38.0	167.7	489,361 61	220,040 45
Prescott and Russell.....	1917	207.0	.....	207.0	3,499,377 53	1,522,242 68
Prince Edward.....	1907	113.0	.....	113.0	1,094,293 38	458,168 90
Renfrew.....	1918	195.0	.....	195.0	2,372,904 28	1,141,775 67
Simcoe.....	1903	255.3	.....	255.3	2,607,224 90	1,148,603 65
Stormont, Dundas and Glengarry.....	1917	313.7	.....	313.7	4,119,269 92	1,986,115 78
Victoria.....	1917	156.3	.....	156.3	1,409,244 27	693,636 41
Waterloo.....	1908	137.0	17.1	154.1	2,067,601 04	987,201 62
Welland.....	1912	108.0	14.5	122.5	3,166,805 17	1,404,050 78
Wellington.....	1903	282.5	11.0	293.5	2,292,461 37	1,019,631 36
Wentworth.....	1902	121.3	31.2	152.5	2,617,298 49	1,124,013 41
York.....	1911	9.0	232.0	241.0	6,650,156 31	2,965,149 61
Totals.....	.....	7,013.4	693.6	7,707.0	\$79,365,551 86	\$35,979,647 66

APPENDIX
SUMMARY,
Statement of Work and

County	Work Done						
	Miles Graded	Miles Stoned	Miles Gravelled	Tile Drain Rods	Bridges	Pipe and Tile Culverts	Other Culverts
Brant.....	7.25	Concrete 4.00	6.75	1,723	.....	27	77
Bruce.....	16.16	Bit. Mac. 1.55	18.50	.....	5	31	20
		Concrete 1.47					
		0.20					
Carleton.....	24.18	Bit. Mac. 5.80	14.95	162	.....	72	1
		Asp. Con. 2.50					
Dufferin.....	5.80		5.30		4	29	.....
Elgin.....	3.50	1.62	0.75	1,354	1	17	.....
Essex.....	4.25	Concrete 0.25	5.00		2	17	1
Frontenac.....	2.00	2.00				4	1
Grey.....	17.10		16.85		3	20	21
			1.50			29	.....
Haldimand.....					1		3
Halton.....					4	68	5
Hastings.....	17.25	8.50	8.25		2	22	10
Huron.....	21.08		15.87		6	57	1
Kent.....	25.20	Concrete 1.52	25.77	1,484			
		6.37					
Lambton.....	12.20	Concrete 0.63	8.45	60		36	12
		3.20					
Lanark.....	7.85	Bit. Mac. 3.90			2	48	6
Leeds and Grenville.....	18.50	3.20	9.00	6	5	65	.....
Lennox and Addington.....	4.20	2.20			2	30	7
Lincoln.....	1.00	1.00				44	2
Middlesex.....	17.56			54	5	31	5
Norfolk.....	7.00		10.50			22	.....
Northumberland and Durham.....	10.08		19.68		6	63	2
				1		67	3
Ontario.....	2.44		33.75	409		13	.....
Oxford.....	20.87	1.87	11.60		5	68	7
Peel.....	14.05		3.97	382	1	47	1
Perth.....	3.97		4.83		2	18	2
Peterborough.....	4.83	4.00					
Prescott and Russell.....	21.16	Bit Mac. 0.33	13.25		1	22	.....
Prince Edward.....	5.53	5.00		4		103	1
Renfrew.....	3.84		3.30		4	20	21
Simcoe.....	18.71		18.54		8	33	2
Stormont, Dundas and Glengarry.....	20.75	13.25					
		Bit. Mac. 1.09	1.00		2	62	13
		3.87					
Victoria.....	5.83	Bit. Mac. 0.21	1.23		3	98	.....
		Asp. Conc. 0.44					
Waterloo.....	8.43	Concrete 1.79	6.75	36		24	2
Welland.....						3	3
		Concrete 0.52					
Wellington.....	6.08	Asp. Con. 0.35	4.25		4	63	1
		12.33					
Wentworth.....	18.37	Concrete 1.00	2.50	139		40	2
		Bit. Mac. 0.75					
York.....	28.00	6.89					
		Bit. Mac. 5.15	2.63	224	4	130	12
		Asp. Con. 6.13					
Totals.....	405.02	*120.88	274.74	6,038	82	1,543	244

*Includes:—

Water-bound Macadam.....	81.50 miles.
Bituminous Macadam.....	18.78 "
Cement Concrete.....	11.18 "
Asphaltic Concrete.....	9.42 "

No. 9

1926

Expenditure on County Roads

Approved Expenditure										
Roads and Culverts	Bridges	Machinery and Repairs	Urban Improvement	Purchase of Gravel Pits	Superintendence	Total Construction	Maintenance	Total Approved Expenditure	Subsidy 50 %	
\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
97,657 68	508 35	15,280 87	6,360 00	908 58	5,164 22	125,879 70	49,643 86	175,523 56	87,392 04	
141,892 96	7,210 56	14,277 31	3,141 80		4,200 24	170,722 87	35,006 13	205,729 00	102,827 06	
229,610 74		7,581 45			10,724 91	247,917 10	64,631 90	312,549 00	156,274 50	
18,850 17	17,275 43	827 10	3,083 44		3,785 04	43,821 18	17,394 46	61,215 64	30,564 11	
20,117 96	7,622 65	9,306 04	3,430 39		3,133 48	43,610 52	77,862 03	121,472 55	60,736 28	
24,442 53	22,918 53	10,655 12	25,672 85	1,497 80	4,589 64	89,776 47	94,890 02	184,666 49	92,214 09	
9,455 88		2,145 28		50 00	2,094 51	13,745 67	50,458 42	64,204 09	32,102 05	
62,528 91	40,504 44	2,616 66	4,216 46		4,895 94	114,762 41	54,861 17	169,623 58	84,717 06	
2,551 81		738 27	2,425 00		2,963 83	8,678 91	48,941 41	57,620 32	28,810 16	
1,631 50	2,098 48	106 77			2,063 95	5,900 70	24,651 38	30,552 08	15,276 04	
59,899 99	12,332 79	5,780 10	21,139 61	250 00	3,484 21	102,886 70	56,066 19	158,952 89	79,476 45	
58,553 23	9,542 01	8,279 48	9,821 00		4,952 85	91,148 57	78,203 18	169,351 75	84,675 88	
86,883 87	6,244 81	7,061 17	9,165 36	3,400 00	4,464 30	117,219 51	76,915 74	194,135 25	97,067 63	
50,500 21	990 83	13,006 29	18,910 46	8,519 43	4,829 05	96,756 27	74,232 50	170,988 77	85,494 39	
120,142 26	38,084 06	10,209 24	38,346 99		3,048 52	209,831 07	21,165 17	230,996 24	115,498 12	
86,143 09	13,010 93	4,785 29	7,286 76		4,439 78	115,665 85	39,454 99	155,120 84	77,560 42	
21,268 33	10,225 42	6,745 23	4,218 00		2,932 16	45,389 14	46,502 99	91,892 13	45,895 81	
11,549 74		3,977 75	4,210 10		4,913 68	24,651 27	59,155 01	83,806 28	41,903 14	
15,527 15	37,550 10	9,200 35	10,352 87	3,390 00	4,904 17	80,924 64	76,080 63	157,005 27	78,351 23	
42,695 31		6,549 28	1,521 86	2,890 00	4,009 89	57,666 34	38,306 21	95,972 55	47,875 28	
40,115 86	11,678 76	5,793 32	4,962 36		4,473 12	67,023 42	27,195 41	94,218 83	47,109 42	
9,792 97	1,357 61	723 41	51,000 00		4,397 33	67,271 32	32,404 34	99,675 66	49,837 82	
63,784 86	138 00	8,774 63	6,878 11		3,183 87	82,759 47	19,194 50	101,953 97	50,976 98	
41,753 02	21,453 36	7,334 02			3,633 40	74,173 80	28,890 16	103,063 96	51,298 04	
30,524 61	2,521 60	14,532 58			4,712 21	52,291 00	31,589 00	83,880 00	41,940 00	
14,361 47	8,912 51	6,244 46			2,119 70	31,638 14	38,836 19	70,474 33	34,345 91	
45,078 07			4,194 35		5,359 96	54,632 38	13,767 61	68,399 99	34,088 97	
33,508 04		8,672 59		800 00	2,219 61	45,200 24	25,239 45	70,439 69	35,219 84	
29,301 48	23,239 80		21,337 50		5,677 25	79,556 03	29,716 96	109,272 99	52,420 78	
66,663 85	24,920 74	1,791 20	49,938 66		3,820 00	147,134 45	45,919 82	193,054 27	96,527 14	
117,213 59	1,665 19	5,979 18	20,549 08		6,840 63	152,247 67	105,284 04	257,531 71	128,756 40	
57,400 76	12,887 79	7,572 38	28,921 67		4,994 60	111,777 20	49,812 13	161,589 33	79,975 56	
75,152 09	567 22	1,029 84	117,636 61		4,254 95	198,640 71	35,100 70	233,741 41	116,870 71	
14,895 61	6,127 02	5,097 35	82,798 75		3,707 50	112,626 23	133,190 21	245,816 44	122,908 22	
22,173 73	4,847 78	4,837 68	7,400 85		3,366 29	42,626 33	87,392 30	130,018 63	64,926 57	
156,597 33		5,718 86	3,588 75		6,338 84	172,243 78	44,479 78	216,723 56	108,361 78	
602,726 12	39,809 47	1,902 86	14,991 08	250 00	6,264 24	665,943 77	41,268 30	707,212 07	353,385 08	
2,582,946 78	386,246 24	225,133 41	587,500 72	21,955 81	160,957 87	3,964,740 83	1,873,704 29	5,838,445 12	2,913,660 96	

APPENDIX

SUMMARY,

Schedule of Expenditure on Maintenance

For the period beginning January 1st, 1926

County	Brushing and Weed Cutting	Ditching	Grading	Dragging	Culverts (Repairs only)
	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
Brant.....	862 13	2,822 75	1,769 29	5,542 87	1 60
Bruce.....	512 47		3,656 96	5,644 51	417 76
Carleton.....	1,556 65	922 18	4,311 41	391 55	717 78
Dufferin.....	67 15	77 60	854 81	2,021 61	132 75
Elgin.....	1,277 08	745 93	8,454 91	5,816 35	1,018 75
Essex.....	1,287 06	2,942 22	1,417 86	11,259 20	284 02
Frontenac.....	115 60	20 10	994 70	1,584 00	322 20
Grey.....	568 66	2,694 05	2,071 30	4,803 56	595 34
Haldimand.....	818 95		536 83	2,633 54	278 75
Halton.....	235 10	236 15	123 70	1,170 50	360 61
Hastings.....	611 53	219 30	10,499 95	3,446 80	3,446 19
Huron.....	1,871 35	1,196 67	3,080 74	11,892 39	1,304 24
Kent.....	2,159 15	1,020 56	3,351 53	13,248 59	358 67
Lambton.....	782 31	2,426 88	1,937 20	18,266 55	5,288 28
Lanark.....	12 00		2,369 21		2,700 83
Leeds and Grenville.....		443 36	1,132 05	1,455 35	302 02
Lennox and Addington.....			6 75	132 20	113 62
Lincoln.....	1,682 36	1,057 15	97 52	2,523 46	1,313 99
Middlesex.....	1,918 48	1,130 20	2,047 74	12,561 90	402 43
Norfolk.....	812 95	127 22	3,160 99	3,903 70	639 50
Northumberland and Durham.....	348 69	1,172 02	745 25	7,703 56	677 54
Ontario.....	830 25	187 38	773 11	4,830 00	432 23
Oxford.....	956 65	582 14	2,077 40	2,361 00	990 94
Peel.....	617 07	263 37	616 75	2,367 95	412 25
Perth.....	379 27	130 50	3,300 25	585 37	228 15
Peterborough.....	170 65	247 25	249 50	4,527 50	1,469 90
Prescott and Russell.....	891 47	909 81	2,561 32	1,146 06	95 63
Prince Edward.....	185 00		205 10	162 20	158 71
Renfrew.....	661 77	17 75	1,562 17	1,184 14	1,290 37
Simcoe.....		85 25	1,247 10	5,734 87	208 80
Stormont, Dundas and Glengarry.....	3,329 60	922 98	3,480 27	542 30	1,382 31
Victoria.....	1,015 45	287 40	4,498 43	5,589 09	266 75
Waterloo.....	8 48	48 50	1,521 47	844 10	1,080 05
Wellsand.....	558 60	1,802 65	5,532 14	38 07	733 39
Wellington.....	333 05	355 16	14,912 10	13,185 71	991 58
Wentworth.....	1,696 20	2,762 55	777 34	3,465 92	174 65
York.....	1,377 46	2,315 79	1,946 98	2,770 94	72 36
Totals.....	30,510 64	30,172 82	97,832 13	165,377 41	30,664 94

No. 10

1926

and Repair on County Roads

and ending December 31st, 1926.

Bridges (Repairs only)	Re-surfacing	Oiling, etc.	Snow Roads	Wire Fence Bonus and Guard Rails	Total Expenditure	Government Grant, 50%
\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
51 65	37,281 33	388 72	800 35	123 17	49,643 86	24,503 02
1,585 33	13,601 51	3,991 20	5,596 39	.....	35,006 13	17,503 06
1,690 83	29,936 36	16,590 78	7,497 35	1,017 01	64,631 90	32,315 95
264 52	12,430 10	.....	1,545 92	.....	17,394 46	8,697 23
2,280 36	52,837 91	2,276 69	3,154 05	.....	77,862 03	38,931 01
854 77	73,209 56	3,017 41	617 92	.....	94,890 02	47,445 01
1,448 36	7,648 82	37,452 32	349 78	522 54	50,458 42	25,229 21
386 17	19,057 18	18,920 96	2,895 40	2,868 55	54,861 17	27,430 58
40 05	43,684 64	.....	948 65	.....	48,941 41	24,470 70
.....	21,885 97	166 03	454 39	18 93	24,651 38	12,325 69
431 98	32,856 09	3,058 74	1,505 61	.....	56,066 19	28,033 09
8,469 18	37,064 41	6,339 86	6,977 34	7 00	78,203 18	39,101 59
4,015 73	48,979 80	1,983 46	649 75	1,148 50	76,915 74	38,457 87
487 31	41,969 85	2,548 97	525 15	.....	74,232 50	37,116 25
.....	10,390 84	3,784 67	1,019 66	887 96	21,165 17	10,582 59
408 81	30,372 71	5,211 19	129 50	.....	39,454 99	19,727 49
302 75	26,465 31	18,277 12	987 74	217 50	46,502 99	23,201 24
19 52	31,293 91	19,302 80	1,864 30	.....	59,155 01	29,577 50
281 38	48,344 63	3,228 75	6,165 12	.....	76,080 63	37,898 90
137 10	26,966 73	820 44	1,688 14	49 44	38,306 21	19,153 10
1,352 66	12,562 95	557 71	2,037 06	37 97	27,195 41	13,597 71
104 78	19,106 57	1,619 48	3,289 86	1,230 68	32,404 34	16,202 17
213 04	10,494 76	.....	1,306 12	212 45	19,194 50	9,597 25
1,176 27	15,735 04	7,507 54	.....	193 92	28,890 16	14,445 08
243 89	21,391 76	1,725 95	3,080 96	522 90	31,589 00	15,794 50
4,701 53	25,508 75	12 00	1,536 13	412 98	38,836 19	19,418 09
91 79	6,371 72	.....	1,699 81	.....	13,767 61	6,879 66
83 35	5,877 72	17,651 22	673 90	242 25	25,239 45	12,619 73
142 05	5,347 62	18,867 48	521 46	122 15	29,716 96	14,858 48
409 53	33,551 35	.....	3,932 70	750 22	45,919 82	22,959 91
1,577 91	44,795 67	44,182 06	5,070 94	.....	105,284 04	52,632 57
77 77	24,154 54	10,608 76	2,724 74	589 20	49,812 13	24,906 07
5,058 20	23,184 51	708 80	2,646 59	.....	35,100 70	17,550 35
2,011 63	77,414 86	41,811 97	3,241 90	45 00	133,190 21	66,595 10
828 94	47,689 76	326 19	8,579 06	190 75	87,392 30	43,629 10
.....	21,279 03	9,916 15	4,407 94	.....	44,479 78	22,239 89
.....	351 20	29,386 36	3,047 21	.....	41,268 30	20,634 15
41,229 14	1,041,095 47	332,241 78	93,168 89	11,411 07	1,873,704 29	936,260 89

APPENDIX
SUMMARY,
Statement of Work and

County	Work Done								
	Miles Graded	Miles Stoned	Miles Gravelled	Tile Drain Rods	Bridges	Pipe and Tile Culverts	Other Culverts	Roads and Culverts	Bridges
Brant.....	5.03		4.83	321	2	22	2	\$ 39,617 45	\$ 53,935 95
Bruce.....	14.62		17.87	18	8	25	12	102,830 09	16,926 37
Carleton.....	25.50	Bit. Mac. 3.00 Asp. Con. 2.65	8.30	80	3	80	7	245,482 16	18,036 09
Dufferin.....	26.60		24.30		3	104		42,873 62	14,828 25
Elgin.....	4.34	1.60	1.90	1,599	1	13	5	33,519 38	4,022 20
Essex.....	10.00	Concrete 7.00	3.00	1,022	5	20	4	231,915 44	24,338 53
Frontenac.....	15.75	11.25	1.75		1	18	2	25,358 27	672 87
Grey.....	17.00		17.00	182	10	22	34	97,770 42	35,169 36
Haldimand.....	26.50	3.00	1.00			176		21,887 31	
Halton.....		7.75					1	9,214 44	559 90
Hastings.....	15.35	Asp. Con. 0.60	6.75		5	44		57,547 10	9,316 01
Huron.....	28.50		29.75		1	21	18	91,140 75	3,595 90
Kent.....	23.67	Asp. Con. 0.36 11.50	31.78	411	2	110		89,261 98	7,709 91
Lambton.....	16.07	Con. 0.32	4.75	1,600	4	49	21	52,402 39	3,215 60
Lanark.....	6.95	Bit. Mac. 6.25 10.15				45	8	80,337 52	6,976 20
Leeds and Grenville.....	18.85	Bit. Mac. 0.70	12.25	60	1	67	1	115,498 31	4,776 53
Lennox and Addington.....	8.21	Asp. Con. 2.65 5.44			3	11		101,376 25	9,548 00
Lincoln.....	14.75	Concrete 12.95	1.80			65	10	170,270 69	1,630 16
Middlesex.....	15.23	Concrete 6.33	1.00	803		25	8	197,721 95	
Norfolk.....	18.00		16.00			44	5	68,265 84	4,717 97
Northumberland and Durham.....	8.87	Asp. Con. 1.37	17.31		6	36	1	33,003 24	12,686 80
Ontario.....	5.97	0.27	7.00	247	5	15	4	15,147 52	12,034 78
Oxford.....	10.36	Asp. Con. 4.36 3.35	10.00	1,071	3	4		112,094 71	7,454 00
Peel.....	21.10	Concrete 2.90	19.35	1,734	1	137		155,277 90	6,161 29
Perth.....	39.40		55.45	23	4	41		70,199 54	9,029 47
Peterborough.....	5.75		4.25			40	2	23,179 39	
Prescott and Russell.....	63.75	10.25	13.25		1	35	7	148,308 92	1,379 00
Prince Edward.....	7.50	Bit. Mac. 2.75			1	56	1	40,758 20	1,005 95
Renfrew.....	4.70		4.20		1	8	9	25,491 44	8,557 47
Simcoe.....	20.73	0.85	20.13		4	28	5	89,068 76	21,623 13
Stormont, Dundas and Glengarry.....	27.00	Bit. Mac. 23.50 1.05	3.00		2		4	119,736 41	2,549 00
Victoria.....	10.80	Asp. Con. 3.97	3.91		3	89	1	75,924 75	9,563 86
Waterloo.....	12.20	Concrete 4.87	6.95	7	1	37	7	211,047 72	4,353 19
Welland.....	7.94	Bit. Mac. 3.25		26		12	12	95,036 16	
Wellington.....	17.34	Concrete 0.50	12.50	61	4	95	7	96,491 08	7,673 61
Wentworth.....	15.95	Bit. Mac. 11.53 2.00		146		29		138,082 68	
York.....	23.17	Concrete 0.31 14.95	8.47	2,812	2	68	6	576,626 85	19,656 42
Totals.....	613.45	*220.27	375.28	12,223	87	1,691	204	3,899,765 63	343,703 77

*Includes:—

Water-bound Macadam.....145.76 miles.
Bituminous Macadam..... 29.59 "
Cement Concrete..... 25.73 "
Asphaltic Concrete..... 19.19 "

IMPROVEMENT IN ONTARIO FOR 1926 AND 1927

69

No. 11

1927

Expenditure on County Roads

Approved Expenditure

Machinery and Repairs	Urban Improvement	Purchase of Gravel Pits	Superintendence	Total Construction	Maintenance	Total Approved Expenditure	Subsidy 50%	Dis-allowed	Receipts
\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
9,451 17		875 00	5,212 93	109,092 50	53,435 22	162,527 72	81,263 86	559 81	10,320 52
16,868 00	32,146 71		4,292 45	173,063 62	56,352 64	229,416 26	114,708 13	509 05	42 00
3,123 47	10,247 71		10,643 52	287,532 95	60,770 16	348,303 11	174,151 56	1,020 84	6,971 09
3,547 59	17,776 85		3,683 23	82,709 54	33,312 94	116,022 48	58,011 24		82 32
9,381 95	6,358 67		3,264 97	56,547 17	108,385 85	164,933 02	82,466 52		2,686 78
13,912 62	1,834 68	1,437 80	4,393 93	277,833 00	97,161 14	374,994 14	187,497 07	394 00	18,628 60
1,273 27		250 00	2,065 92	29,620 33	64,405 13	94,025 46	47,012 73		5,977 67
6,975 86	8,330 60		4,442 34	152,688 58	38,042 46	190,731 04	94,186 38	872 45	
3,550 05	3,395 00		3,746 27	32,578 63	48,768 14	81,346 77	40,673 39	261 69	
792 12	19,122 20		2,065 40	31,754 06	27,098 70	58,852 76	26,501 72	944 77	
7,866 58	10,370 92		3,667 00	88,767 61	78,485 58	167,253 19	83,626 59	1,443 76	
6,805 60	22,764 76		5,197 73	129,504 74	87,901 18	217,405 92	108,702 96	31 00	1,462 69
24,846 69	39,252 97		4,822 70	165,894 25	86,679 40	252,573 65	126,286 82	3,319 17	1,732 82
12,451 47	9,762 78	10,813 26	4,038 18	92,683 68	93,714 80	186,398 48	93,199 24	90 40	6,012 02
7,562 71	37,188 84		4,823 41	136,888 68	25,982 16	162,870 84	81,435 42	4,121 17	662 85
2,588 34	19,661 81		3,296 02	145,821 01	28,299 74	174,120 75	87,060 38	33 00	84 75
2,306 17	22,297 20		2,941 26	138,468 88	45,573 70	184,042 58	92,021 29		
11,446 06	4,912 72		4,888 28	193,147 91	65,645 77	258,793 68	129,396 84	1,549 53	727 22
7,237 91			5,023 31	209,983 17	88,467 17	298,450 34	149,225 17		45,489 42
9,123 63	9,655 87		4,458 65	96,221 96	57,786 13	154,008 09	77,004 05		540 53
5,176 34	25,000 00		4,216 37	80,082 75	42,267 15	122,349 90	61,174 95	420 00	1,181 22
3,368 21			4,985 94	35,536 45	43,326 45	78,862 90	39,431 45	94 13	810 27
9,320 76			3,010 20	131,879 67	52,756 19	184,635 86	92,317 93	2,211 90	3,022 69
2,012 55			3,947 36	167,399 10	32,499 31	199,898 41	99,949 20	4,902 54	14,117 52
2,891 92		400 00	3,574 23	86,095 16	17,316 56	103,411 72	51,705 86		78 40
6,493 55			3,471 00	33,143 94	46,026 85	79,170 79	39,585 39	310 26	758 94
1,565 80			3,124 26	154,377 98	54,327 74	208,705 72	104,352 86	1,274 64	571 43
9,373 90		700 00	2,170 52	54,008 57	32,432 31	86,440 88	43,220 44	3,455 08	
826 71	29,610 00		5,470 64	69,956 26	47,269 81	117,226 07	57,757 29	1,288 40	1,521 82
2,387 85	60,236 17		3,585 00	176,900 91	53,118 30	230,019 21	114,456 59	900 00	54 10
2,626 61	19,142 23		5,563 96	149,618 21	141,340 20	290,958 41	145,479 21	455 10	
7,536 96	28,921 67		5,785 20	127,732 44	53,123 97	180,856 41	90,428 21	7,580 83	
7,943 79	5,468 60		4,990 16	233,803 46	34,725 19	268,528 65	134,264 32	6,373 50	1,115 70
4,833 55	11,764 65		3,818 48	115,452 84	111,976 13	227,428 97	113,714 49	6 00	
5,387 53	7,400 85		3,967 95	120,921 02	106,988 86	227,909 88	113,954 94	604 13	3,969 13
4,225 97			6,510 85	148,819 50	55,329 77	204,149 27	102,074 63	1,452 14	3,155 56
1,884 82	27,854 08		11,884 39	637,906 56	98,934 96	736,841 52	368,420 76	11,717 83	
238,968 08	490,478 54	14,476 06	167,044 01	5,154,437 09	2,270,027 76	7,424,464 85	3,706,719 88	58,197 12	131,778 06

**APPENDIX
SUMMARY,
Schedule of Expenditure on Maintenance**
For the period beginning January 1st, 1927,

County	Brushing and Weed Cutting	Ditching	Grading	Dragging	Culverts	Bridges
	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
Brant.....	1,440 19	2,396 89	2,786 66	5,575 28	236 13	191 91
Bruce.....	1,139 07		4,332 75	9,760 56	358 82	720 08
Carleton.....	3,923 92	3,032 73	2,220 55	1,090 51	424 77	2,234 53
Dufferin.....	221 20	1,504 40	2,599 15	3,368 61	72 70	1,276 78
Elgin.....	1,684 26	1,760 94	11,068 38	7,934 69	1,236 59	4,797 49
Essex.....	2,500 29	4,701 26	1,722 49	16,922 37	328 18	1,335 36
Frontenac.....	345 15	40 75	1,463 80	2,486 85	716 67	77 22
Grey.....	526 85	452 15	1,227 82	6,891 26	533 13	1,030 57
Haldimand.....	1,030 10	682 15	1,093 40	2,514 48	493 03	1,144 28
Halton.....	354 86	345 60	2,997 37	1,576 44	1,382 17	112 65
Hastings.....	942 48		14,832 05	3,406 57	4,525 66	1,693 92
Huron.....	2,372 41	1,233 65	3,535 21	18,534 47	1,936 21	4,951 96
Kent.....	3,481 33	2,365 37	1,924 83	19,412 80	171 04	14,848 52
Lambton.....	970 30	833 93	2,763 37	21,445 87	4,120 43	885 97
Lanark.....	2,378 30	2,124 17	1,470 48	1,538 55	3,286 32	1,151 73
Leeds and Grenville.....	32 75	585 00	2,550 20	1,005 69	167 86	1,503 71
Lennox and Addington.....	68 88	81 45	227 75	36 00	298 70	349 04
Lincoln.....	2,165 68	2,681 94	591 25	3,439 49	954 41	885 74
Middlesex.....	2,679 82	1,187 50	1,291 56	16,665 59	362 47	2,573 08
Norfolk.....	1,041 55	352 79	1,743 88	4,474 74	344 31	555 42
Northumberland and Durham	505 97	1,445 55	1,462 73	7,595 47	664 58	7,619 19
Ontario.....	928 05	740 79	868 20	4,707 21	206 99	2,451 96
Oxford.....	1,079 68	696 28	380 48	5,398 17	422 99	829 45
Peel.....	494 06	741 34	776 90	2,802 98	142 73	2,159 47
Perth.....	1,021 33	110 45	3,541 18	2,536 34	410 43	87 35
Peterborough.....	266 35	942 59	1,070 14	6,043 78	388 34	10,484 19
Prescott and Russell.....	926 46	582 15	2,705 15	1,428 36	148 98	363 60
Prince Edward.....	251 00		155 00	86 20	85 00	472 33
Renfrew.....	838 25		2,218 72	1,120 35	920 81	1,593 79
Simcoe.....		489 04	2,526 00	9,526 66	280 53	1,057 42
Stormont, Dundas and Glen- garry.....	1,549 72	237 25	3,449 35	339 75	1,802 96	2,298 59
Victoria.....	2,411 40	1,095 61	6,711 17	8,001 55	268 96	1,924 73
Waterloo.....	333 55	460 70	2,208 04	1,253 70	195 36	261 07
Welland.....	1,896 25	1,587 35	2,708 25	21 00	693 22	45 15
Wellington.....	1,656 67	867 85	14,978 07	11,941 88	1,559 32	1,746 72
Wentworth.....	3,233 32	4,853 32	2,571 37	5,705 81	874 75	293 55
York.....	3,021 92	2,376 03	2,293 45	4,000 85	1,033 83	906 17
Totals.....	49,713 37	43,589 06	113,067 15	220,590 88	32,049 38	76,914 69

**APPENDIX
Summary of Expenditure**

The following schedule shows in detail the work and approved expenditure on Township

General Expenditure

Year	No. of Twps.	Roads and Culverts	Bridges	Maintenance	Machinery	Purchase of Gravel Pits
		\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
1920	172	432,618 62	270,596 52	828,027 27	91,704 24	8,513 47
1921	294	844,829 42	501,650 14	1,888,048 75	142,316 18	12,420 81
1922	312	774,336 84	374,158 51	1,832,200 75	87,936 37	23,573 06
1923	315	665,101 32	420,451 17	1,720,273 23	82,020 62	30,453 57
1924	320	725,631 40	334,348 63	1,861,036 56	95,758 21	12,727 08
1925	272	930,129 31	249,633 82	1,720,775 30	121,874 98	7,886 11
1926	295	1,379,063 62	282,968 54	2,154,503 96	188,804 36	33,251 25
1927	307	1,820,991 31	322,023 33	2,583,130 89	226,160 80	23,918 64
Totals		7,572,701 84	2,755,830 66	14,587,996 71	1,036,575 76	152,743 99

No. 12

1927

and Repair on County Roads

and ending December 31st, 1927

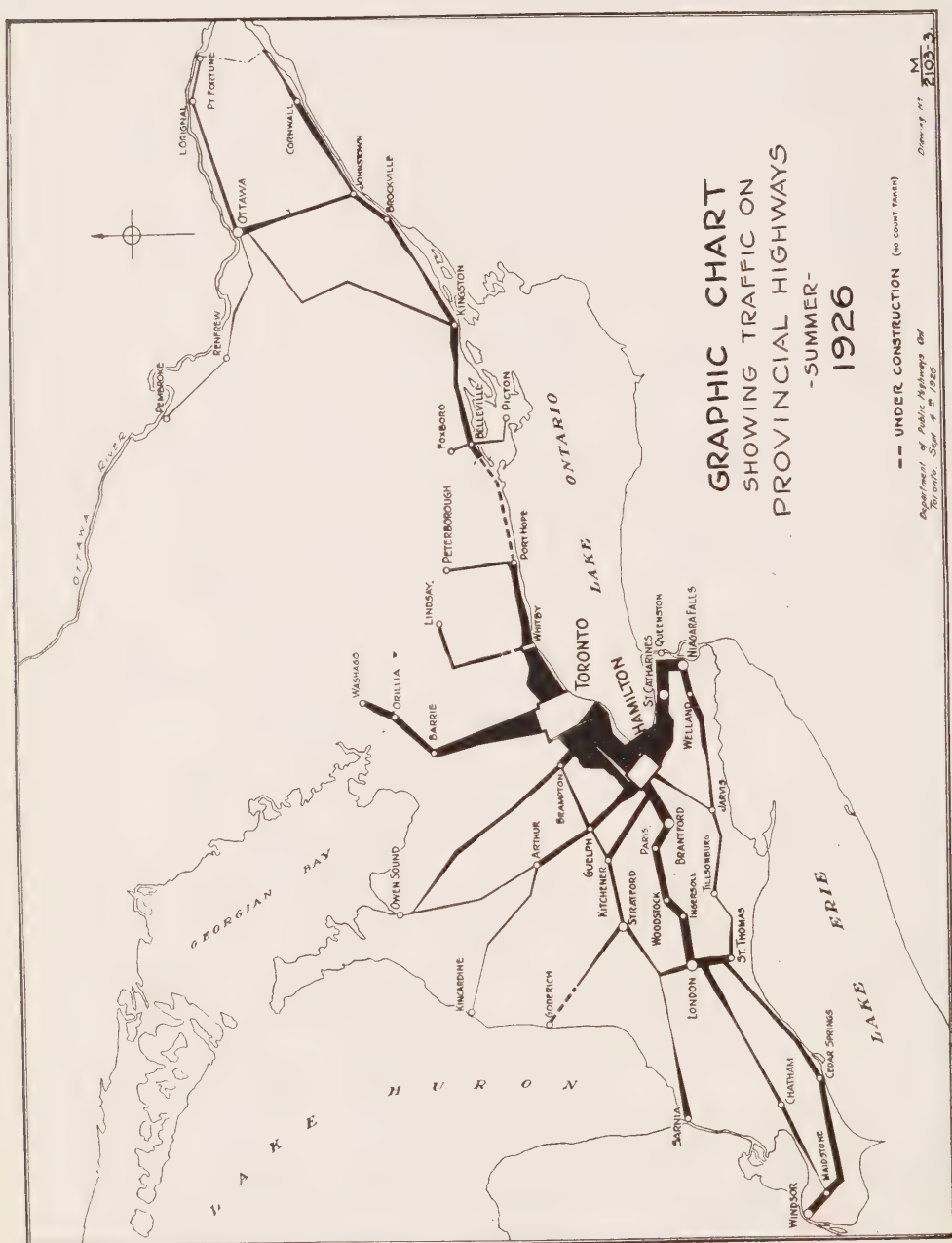
Re-surfacing	Oiling, etc.	Snow Roads	Wire Fence Bonus and Guard Rails	Urban Improvement	Total Expenditure	Government Grant, 50%
\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
39,989 34		403 88	414 85		53,435 22	26,717 61
29,359 70	90 61	1,038 51		9,552 54	56,352 64	28,176 32
26,408 56	10,286 14	8,691 63	2,456 82		60,770 16	30,385 08
21,015 09		608 34	52 00	2,594 67	33,312 94	16,656 47
73,302 47	3,879 18	1,313 52		1,408 33	108,385 85	54,192 92
64,542 55	4,821 19	287 45			97,161 14	48,580 57
30,768 82	27,750 88	270 40	484 59		64,405 13	32,202 56
22,929 24	1,576 99	623 33	2,251 12		38,042 46	19,021 23
41,729 35		81 35			48,768 14	24,384 07
20,055 25	134 49	139 87			27,098 70	13,549 35
41,829 07	9,408 62	1,847 21			78,485 58	39,242 79
42,186 02	9,982 50	2,825 59	343 16		87,901 18	43,950 59
44,285 28		190 23			86,679 40	43,339 70
58,879 48	2,516 03	31 00	46 55	1,221 87	93,714 80	46,857 40
9,907 78		1,853 99	2,270 84		25,982 16	12,991 08
17,133 33	5,200 50	120 70			28,299 74	14,149 87
32,794 53	11,363 90	345 20	8 25		45,573 70	22,786 85
39,283 60	10,245 81	265 04	148 68	4,984 13	65,645 77	32,822 88
57,620 59	4,568 99	1,517 57			88,467 17	44,233 57
46,965 78	925 19	1,317 99	64 48		57,786 13	28,893 06
16,396 36	1,878 43	552 63	9 26	4,136 98	42,276 15	21,133 57
29,259 63	1,734 29	1,430 48	998 85		43,326 45	21,663 23
41,538 70	1,804 73	456 58	149 13		52,756 19	26,378 10
18,921 86	6,403 32	39 00	17 65		32,499 31	16,249 66
4,615 58		408 85		4,585 05	17,316 56	8,658 28
23,760 58	1,102 56	204 35	124 21	1,639 76	46,026 85	23,013 42
16,701 16	22,877 00	1,390 42	265 70	6,938 76	54,327 74	27,163 87
8,507 19	21,392 29	250 05	1,233 25		32,432 31	16,216 16
20,026 37	19,808 56	338 65	404 31		47,269 81	23,634 91
37,632 54		377 75	1,228 36		53,118 30	26,559 15
60,897 17	65,196 47	5,287 37	281 57		141,340 20	70,670 10
21,535 28	7,401 62	2,011 91	1,761 74		53,123 97	26,561 99
25,374 93	2,787 87	1,842 56	7 41		34,725 19	17,362 60
53,388 63	50,831 33	701 45	103 50		111,976 13	55,988 06
68,799 46	1,224 57	4,199 62	14 70		106,988 86	53,494 43
28,200 35	4,511 80	1,241 77		3,843 73	55,329 77	27,664 88
36,717 17	43,490 11	2,531 18		2,564 25	98,934 96	49,467 49
1,273,258 79	355,195 97	47,037 42	15,140 98	43,470 07	2,270,027 76	1,135,013 87

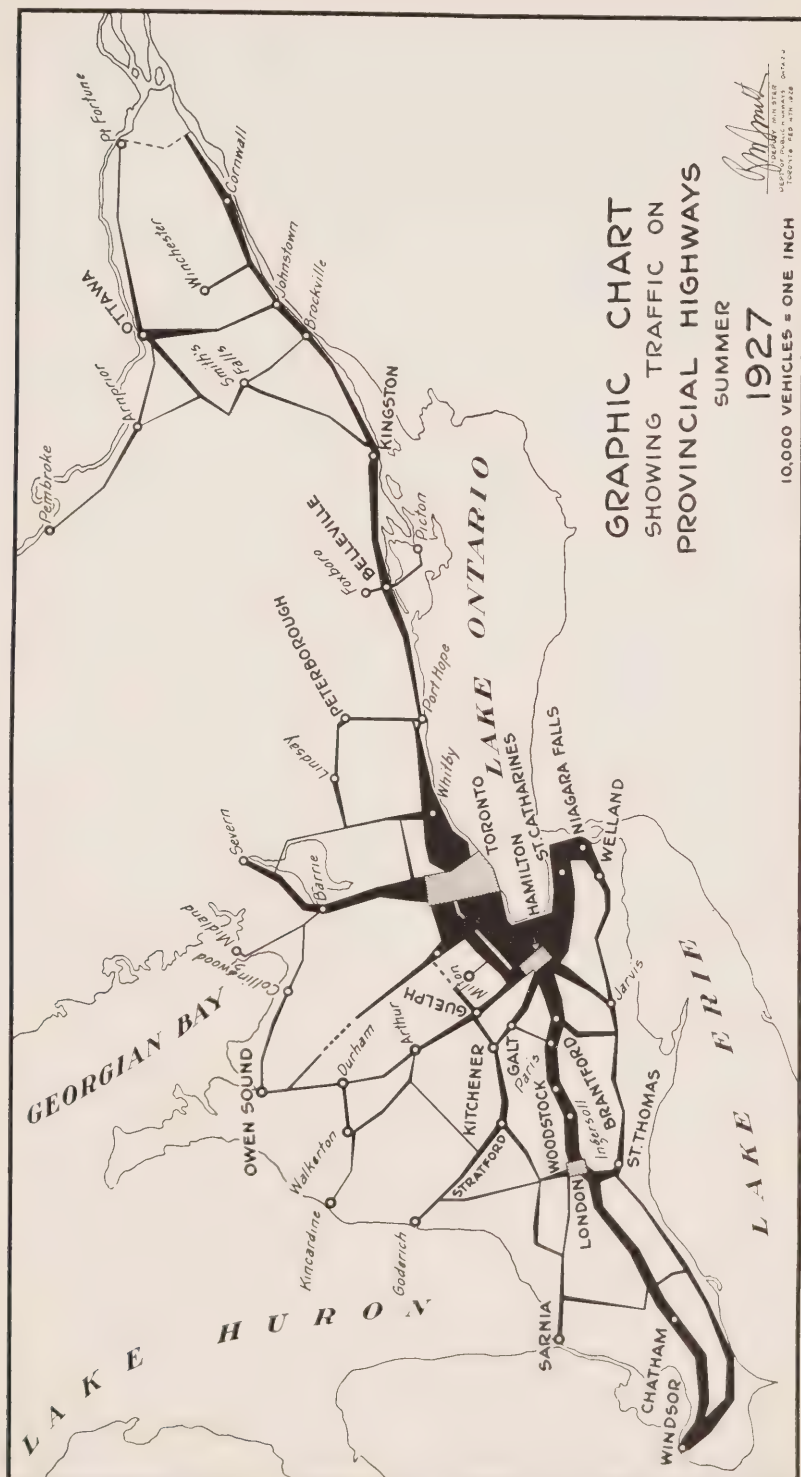
No. 13

on Township Roads

Roads to the end of 1927, under the provisions of the Highway Improvement Act.

Approved Expenditure	Government Grant	Superintendence		Total Approved Expenditure	Total Government Grant
		Approved Expenditure	Government Grant		
\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
1,631,460 12	326,291 95	36,703 60	14,681 43	1,668,163 72	340,973 38
3,389,265 30	677,852 90	76,585 03	30,634 01	3,465,850 33	708,486 91
3,092,205 53	618,440 93	77,901 44	31,160 55	3,170,106 97	649,601 48
2,918,299 91	583,659 65	75,945 31	30,378 23	2,994,245 22	614,037 88
3,029,501 88	605,900 35	82,599 41	33,039 76	3,112,101 29	638,940 11
3,030,299 52	906,559 91	164,146 58	82,073 38	3,194,446 10	988,633 29
4,038,591 73	1,219,741 01	194,317 68	97,405 16	4,232,909 41	1,317,146 17
4,976,224 97	1,504,718 50	228,349 52	114,451 24	5,204,574 49	1,619,169 74
26,105,848 96	6,443,165 20	936,548 57	433,823 76	27,042,397 53	6,876,988 96





APPENDIX No. 14
PROVINCIAL HIGHWAY TRAFFIC CENSUS—1925, 1926, 1927—SUMMER

TRAFFIC CENSUS

AVERAGE DAILY AVERAGE—SUMMER

Highway No.	Name of Road	No. of Stations	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
				Ontario	Foreign					
2	Windsor to Quebec boundary.....	35	1925	1,265	420	151	17	45	1,898	2,414
		33	1926	1,911	513	185	25	36	2,670	3,861
		36	1927	1,887	833	221	25	31	2,997	4,271
3	Windsor to Niagara Falls.....	16	1925	558	277	61	2	27	925	1,429
		16	1926	784	278	109	7	36	1,214	1,656
		17	1927	932	362	112	6	26	1,438	2,469
3A	Chambers Corners to Fort Erie.....	2	1925	680	1,120	110	16	62	1,988	2,705
		2	1926	972	1,196	129	12	29	2,338	3,115
		3	1927	476	1,614	83	12	25	2,210	3,405
4	St. Thomas to Clinton.....	6	1925	753	212	65	3	23	1,056	1,665
		6	1926	1,096	179	71	4	25	1,375	1,881
		6	1927	889	95	69	3	21	1,077	1,766
4A	Walkerton to Durham.....	1	1925	244	18	26	3	38	326	651
		1	1926	486	18	24	2	46	576	653
		1	1927	592	21	35	4	38	690	1,236
5	Toronto to Highway No. 8.....	6	1925	2,017	161	213	11	15	2,417	3,803
		6	1926	3,021	178	237	19	13	3,468	5,514
		6	1927	2,739	238	273	12	9	3,271	5,091
6	Port Dover to Owen Sound.....	9	1925	563	52	54	4	45	718	1,136
		11	1926	908	58	74	11	41	1,092	1,726
		11	1927	869	74	99	10	34	1,086	1,816
7	Sarnia to Peterborough.....	20	1925	401	74	31	1	27	534	863
		19	1926	579	102	39	6	25	751	1,096
		20	1927	555	76	54	4	27	716	1,090
8	Niagara Falls to Goderich.....	11	1925	1,599	1,013	203	31	37	2,883	4,141
		10	1926	2,242	1,255	235	44	33	3,809	5,524
		11	1927	1,844	1,231	288	44	33	3,380	5,500
8A	Burlington Beach.....	2	1925	2,096	344	185	2	48	2,675	3,856
		2	1926	4,287	694	297	7	31	5,316	9,222
		2	1927	3,028	395	233	7	43	3,706	6,175

9	Arthur to Kincardine.....	4	1925	191	9	12	.....	45	257	378
			1926	351	15	17	.....	46	429	672
10	Port Credit to Chatsworth.....	4	1927	298	16	25	.....	33	372	598
		5	1925	796	25	75	.....	38	939	1,491
		5	1926	1,130	22	93	10	35	1,290	2,428
11	Toronto to Severn.....	5	1927	1,037	40	128	7	21	1,233	1,921
		7	1925	1,691	210	150	2	23	2,076	3,148
		7	1926	2,725	218	140	10	19	3,112	4,943
12	Whitby to Orillia.....	7	1927	2,353	266	174	8	15	2,816	5,011
		3	1925	443	28	28	.....	24	523	914
		2	1926	564	27	24	3	26	644	1,035
14	Pictou to Foxboro.....	3	1927	653	39	39	41	3	758	1,393
		3	1925	527	28	40	1	41	637	961
		3	1926	432	24	41	1	50	548	864
15	Kingston to Ottawa.....	3	1927	551	29	66	2	59	707	1,077
		6	1925	408	71	30	3	54	566	904
		5	1926	446	50	30	2	48	576	830
16	Johnstown to Ottawa.....	6	1927	541	66	43	3	56	709	1,067
		3	1925	618	134	43	10	33	838	1,087
		3	1926	763	169	58	9	30	1,029	1,551
17	Pembroke to Point Fortune.....	3	1927	909	194	53	7	22	1,185	1,695
		7	1925	252	98	22	9	67	448	615
		7	1926	329	108	34	7	55	533	790
		7	1927	327	70	37	4	49	487	682

AVERAGE DAILY AVERAGE—FALL

TRAFFIC CENSUS

DAILY AVERAGE

High-way No.	Name of Road	Number of Stations	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
				Ontario	Foreign					
2	Windsor to Quebec boundary.....	34	1925	761	55	143	23	47	1,029	1,348
		32	1926	1,070	115	190	28	44	1,447	1,971
		37	1927	1,436	264	222	24	36	1,982	3,266
3	Windsor to Niagara Falls.....	15	1925	368	23	56	6	37	490	630
		16	1926	504	54	80	5	36	679	939
		18	1927	736	152	105	6	31	1,030	1,798
3A	Chambers Corners to Fort Erie.....	2	1925	529	172	80	13	46	840	1,146
		2	1926	539	200	97	15	22	897	1,172
		3	1927	527	326	92	11	27	978	1,686
4	St. Thomas to Clinton.....	6	1925	380	8	39	2	27	456	573
		6	1926	617	18	62	4	28	729	979
		6	1927	802	37	77	5	25	946	1,576
4A	Walkerton to Durham.....	1	1925	88	.....	5	.....	41	134	205
		1	1926	128	.....	5	.....	47	180	243
		1	1927	400	4	24	5	39	472	762
5	Toronto to Highway No. 8.....	6	1925	1,423	28	225	11	15	1,702	2,537
		6	1926	1,616	52	237	11	14	1,930	2,739
		6	1927	2,806	89	353	15	13	3,276	6,350
6	Port Dover to Owen Sound.....	10	1925	354	5	42	4	43	484	608
		11	1926	500	12	66	8	46	632	839
		11	1927	845	19	113	10	35	1,022	1,797
7	Sarnia to Peterborough.....	20	1925	223	9	26	.....	31	289	413
		18	1926	339	19	42	4	29	433	609
		21	1927	474	28	51	4	21	578	1,056
8	Niagara Falls to Goderich.....	10	1925	882	177	171	28	31	1,289	1,866
		11	1926	1,093	245	247	36	40	1,661	2,259
		11	1927	1,571	527	291	42	31	2,462	4,178
8A	Burlington Beach.....	2	1925	739	48	140	.....	36	963	1,654
		0	1926	1,129	Under construction	192	5	24	1,479	2,939
		2	1927	1,129	129	192	5	24	1,479	2,939

9	Arthur to Kincardine.....	4	1925	89	1	6	.....	56	152	184
		4	1926	154	4	9	.....	32	199	281
10	Port Credit to Chatsworth.....	4	1927	244	5	24	.....	24	297	487
		5	1925	564	4	76	.....	47	696	1,124
11	Toronto to Severn.....	4	1926	610	5	101	5	25	746	1,059
		4	1927	835	7	149	7	25	1,023	1,492
		7	1925	770	6	139	4	27	946	1,160
		7	1926	831	16	128	9	20	1,004	1,349
12	Whitby to Orillia.....	7	1927	1,511	34	198	7	21	1,771	3,209
		3	1925	201	1	27	.....	30	259	553
		2	1926	222	1	24	2	21	270	389
14	Picton to Foxboro.....	3	1927	455	6	44	2	25	532	1,034
		3	1925	258	2	24	3	43	330	431
		3	1926	301	4	37	1	49	392	560
15	Kingston to Ottawa.....	3	1927	477	4	60	3	49	593	842
		5	1925	225	5	23	3	49	305	455
		6	1926	239	7	24	1	44	315	492
16	Johnstown to Ottawa.....	6	1927	370	13	35	2	38	458	801
		3	1925	239	35	28	6	36	344	492
		2	1926	427	46	50	5	32	560	716
		3	1927	578	93	63	5	27	766	1,239

AVERAGE DAILY AVERAGE — SUMMER
Traffic Census

Highway No.	Name of Road	Number of Stations	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
				Ontario	Foreign					
21	Morpeth to Highway No. 7	3	1925	259	192	23	....	27	501	803
		3	1926	294	28	23	2	25	372	497
		3	1927	547	181	57	4	22	811	1,309
22	London to Highway No. 7, via Strathroy...	1	1925	306	588	23	3	19	1,225	1,388
		1	1926	294	787	21	3	8	1,113	836
		1	1927	266	306	19	2	7	600	303
23	Mitchell to Teviotdale	2	1925	141	9	9	....	27	186	315
		2	1926	196	8	13	....	28	245	466
		2	1927	245	12	18	....	31	306	601
24	Simcoe to Guelph	1	1925	304	9	46	1	71	431	887
		1	1926	513	29	60	1	56	659	1,008
		3	1927	541	33	66	....	31	671	341
25	Palermo to Milton	1	1925	186	1	12	....	10	209	308
		1	1926	249	3	14	6	8	280	309
		1	1927	198	2	21	1	8	230	451
26	Barrie to Owen Sound	4	1925	255	18	17	....	16	306	650
		4	1926	389	18	20	....	23	450	541
		4	1927	363	17	26	....	25	431	360
27	Barrie-Midland-Penetang	1	1925	170	7	10	....	6	193	510
		1	1926	263	7	14	4	1	289	334
		1	1927	236	9	12	1	1	259	910
28	Port Hope to Peterborough	1	1925	467	51	33	....	19	570	1,134
		2	1926	584	75	43	4	35	741	1,383
		2	1927	539	126	57	4	25	751	1,229
29	Brockville to Arnprior	2	1925	95	8	22	....	40	165	253
		2	1926	126	11	22	....	39	198	466
		5	1927	228	15	20	2	47	312	

AVERAGE DAILY AVERAGE—FALL
Traffic Census

Highway No.	Name of Road	Number of Stations	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
				Ontario	Foreign					
17	Pembroke to Point Fortune.....	7	1925	124	21	21	5	49	220	300
		7	1926	167	30	23	5	55	280	414
		7	1927	304	58	36	3	50	451	737
21	Morpeth to Highway No. 7.....	3	1925	147	27	17	....	23	214	295
		3	1926	233	7	17	....	21	280	375
		4	1927	357	16	27	4	35	439	665
22	London to Highway No. 7, via Strathroy...	1	1925	171	80	32	2	13	298	391
		1	1926	145	106	22	2	8	283	388
		1	1927	233	98	31	2	7	371	588
23	Mitchell to Teviotdale.....	2	1925	122	....	9	....	56	187	230
		2	1926	135	3	9	....	44	191	214
		2	1927	235	5	19	....	30	289	458
24	Simcoe to Guelph, via Brantford.....	1	1925	146	1	26	....	70	243	359
		1	1926	284	3	64	....	45	396	498
		5	1927	500	11	73	2	26	612	1,020
25	Palermo to Milton.....	1	1925	198	....	25	....	46	269	467
		1	1926	187	1	22	4	22	236	304
		1	1927	197	2	17	1	11	228	374
26	Barrie to Owen Sound.....	4	1925	134	1	11	....	24	170	251
		4	1926	206	1	34	....	36	277	341
		4	1927	298	2	33	2	34	369	518
27	Barrie to Midland and Penetanguishene....	1	1925	59	....	7	....	7	73	111
		1	1926	54	....	6	....	4	64	81
		1	1927	104	....	7	....	2	113	183
28	Port Hope to Peterborough.....	2	1925	204	2	25	....	36	267	356
		2	1926	269	8	38	3	45	363	573
		2	1927	425	12	67	2	25	531	1,038
29	Brockville to Arnprior.....	2	1925	75	1	18	....	43	137	188
		2	1926	74	1	14	....	39	128	173
		5	1927	634	16	71	6	140	867	1,213

AVERAGE DAILY AVERAGE—SUMMER
Traffic Census

Highway No.	Name of Road	Number of Stations	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
				Ontario	Foreign					
31	Morrisburg North.....	2	1925	463	49	55	6	133	706	862
		2	1926	414	49	44	5	86	598	791
		2	1927	453	57	44	7	103	664	906
	Taking the average for each of									
	The 164 stations on 28 highways.....	164	1925	17,748	5,223	1,749	130	1,060	25,910	38,246
	" " 27 ".....	161	1926	26,348	6,117	2,111	204	933	35,713	54,094
	" " 28 ".....	175	1927	24,096	6,417	2,314	182	864	33,873	53,821
	Total Average Daily at each Station on each Road.....									
			1925	634	187	62	5	38	926	1,366
			1926	976	227	78	7	35	1,323	2,004
			1927	860	229	83	7	31	1,210	1,922

Some of the roads shown under Provincial Highways were County Roads in 1925 and 1926, but for the purpose of comparing them with 1927 traffic, we have entered them under Provincial Highways.

1925 count was taken August 5th to August 11th—5 days fine, 2 days showery.

1926 count was taken July 29th to August 4th—5 days fine, 2 days rain.

1927 count was taken July 13th to July 19th—3 days fine, 4 days rain.

AVERAGE DAILY AVERAGE—FALL
Traffic Census

Highway No.	Name of Road	Number of Stations	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
				Ontario	Foreign					
31	Morrisburg North.....	2	1925	241	11	32	7	105	396	516
		2	1926	205	9	21	3	61	299	383
		2	1927	480	39	47	6	104	676	857
	Total No. Stations 156 on 28 Highways.....	.....	1925	9,713	723	1,474	122	1,114	13,146	18,833
		.....	1926	11,149	967	1,669	153	933	14,871	20,340
		.....	1927	18,963	1,996	2,521	181	950	24,611	42,163
	Average Daily at each Station on each Road	.....	1925	347	26	53	4	40	470	673
		.....	1926	398	35	60	5	33	531	727
		.....	1927	677	71	90	7	34	879	1,506

Some of the roads shown under Provincial Highways were County Roads in 1925 and 1926, but for the purpose of comparing them with 1927 traffic we have entered them under Provincial Highways. In 1927, Highways 3A and 4A and 21 to 31 were assumed.

1925 count was taken from October 24th to October 30th—2 days fine, 5 days rain.

1926 count was taken from October 24th to October 30th—4 days fine, 3 days rain.

1927 count was taken from October 12th to October 18th—6 days fine, 1 day rain.

WINDSOR-QUEBEC BOUNDARY HIGHWAY

Highway No. 2

Traffic Census Summer

DAILY AVERAGE

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
1	South of Windsor at Howard Ave.....	1925	972	640	102	4	9	1,727	2,654
		1926	1,795	173	529	24	131	2,652	3,425
		1927	2,165	1,373	328	11	16	3,893	5,140
2	Maidstone.....	1925	151	18	18	.....	13	200	410
		1926	186	41	30	.....	22	279	382
		1927	758	1,077	91	11	11	1,948	2,863
3	Woodslee.....	1925	199	16	122	.....	27	364	423
		1926	271	38	42	.....	31	382	430
		1927	933	1,148	127	12	27	2,247	3,771
4	W. of Chatham at Townline Road between Tilbury East and North.....	1925	482	187	43	10	21	743	1,360
		1926	712	389	57	13	11	1,182	1,748
		1927	967	1,379	114	13	16	2,489	4,098
5	E. of Chatham at Tupperville Road.....	1925	486	58	64	4	13	625	911
		1926	715	237	75	7	7	1,041	1,430
		1927	1,131	1,132	136	14	13	2,426	3,518
6	Wardsville.....	1925	317	59	28	1	51	456	558
		1926	Under construction						
		1927	840	1,070	143	9	29	2,091	3,073
7	Christina.....	1925	73	3	14	.....	11	101	110
		1926	525	173	35	6	15	754	984
		1927	806	1,012	87	8	12	1,925	2,970
8	Lambeth.....	1925	664	129	51	1	13	858	1,166
		1926	1,590	300	125	7	11	2,033	2,652
		1927	1,481	1,142	164	14	11	2,812	4,135

WINDSOR-QUEBEC BOUNDARY HIGHWAY

Highway No. 2

Traffic Census—Fall

DAILY AVERAGE

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
1	South of Windsor at Howard Ave.	1925	1,160	50	192	37	60	1,499	1,515
		1926	1,500	17	378	2	56	1,953	2,246
		1927	1,687	711	266	21	10	2,695	4,970
2	Maidstone.	1925	127	11	23	.....	12	173	322
		1926	412	142	552	1	35	642	1,121
		1927	650	505	102	14	43	1,314	2,578
3	Woodlee.	1925	Under construction						
		1926	579	148	85	11	33	856	1,429
		1927	675	471	120	13	40	1,319	2,399
4	West of Chatham at Townline Road between Tilbury East and Tilbury North.	1925	383	108	54	9	50	604	938
		1926	571	279	101	11	49	1,011	1,698
		1927	786	571	152	14	36	1,559	2,705
5	East of Chatham at Tupperville Road.	1925	418	38	41	3	19	519	677
		1926	663	218	72	6	19	978	1,423
		1927	954	442	182	15	9	1,602	2,373
6	Wardville.	1925	383	79	36	1	48	547	643
		1926	Under construction						
		1927	684	363	87	9	23	1,166	1,761
7	Christina.	1925	320	35	34	1	16	406	445
		1926	446	110	55	7	9	627	841
		1927	702	345	85	9	10	1,151	1,869
8	Lambeth.	1925	1,058	23	148	6	28	1,263	1,486
		1926	1,097	111	109	5	15	1,357	1,762
		1927	1,755	359	179	19	18	2,330	3,972

WINDSOR-QUEBEC BOUNDARY HIGHWAY

Traffic Census—Summer

Highway No. 2

DAILY AVERAGE

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
9	East of London at Wyton.....	1925	1,036	1,012	82	2	17	2,149	3,357
10	Beachville.....	1926	1,629	1,031	128	2	12	2,802	4,069
		1927	1,615	1,194	183	14	8	3,014	4,461
11	Eastwood Corners.....	1925	1,121	867	98	1	101	2,188	2,762
		1926	1,395	966	98	17	62	2,538	3,597
12	Concessions II and I, Brantford Twp.....	1927	1,479	1,285	161	18	58	3,001	4,267
		1925	773	756	69	1	15	1,614	2,318
13	Cainsville.....	1926	1,286	926	85	1	14	2,312	3,271
		1927	1,184	1,159	134	7	10	2,494	3,730
14	Binkley's Corners.....	1925	924	459	81	1	10	1,475	2,175
		1926	1,717	863	135	3	12	2,730	4,089
15	Burlington.....	1927	1,692	1,123	142	6	71	2,969	4,651
		1925	1,608	814	164	32	64	4,327	6,158
16	Oakville.....	1926	2,785	1,236	228	14	60	3,477	5,136
		1927	1,967	1,178	252	20	38	3,762	5,273
17	Burlington.....	1925	1,817	789	223	.....	29	4,011	5,663
		1926	2,543	931	306	16	15	4,899	6,818
18	Oakville.....	1927	2,433	1,234	506	65	5	6,140	8,691
		1925	3,202	1,111	541	85	8	6,410	9,185
19	Oakville.....	1926	4,376	1,133	750	76	20	4,448	5,598
		1927	4,135	1,441	482	61	13	5,676	8,658
20	Oakville.....	1925	2,889	996	655	87	17	5,981	8,239
		1926	4,058	1,009	655	78	17	5,981	8,239
21	Oakville.....	1927	3,818	1,413	655	78	17	5,981	8,239

WINDSOR-QUEBEC BOUNDARY HIGHWAY

Highway No. 2

Traffic Census—Fall

DAILY AVERAGE

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
9	East of London at Wyton	1925	685	152	109	1	22	969	1,245
		1926	970	235	134	8	11	1,358	1,953
9½	Thamesford Corner	1927	1,297	368	191	11	10	1,877	3,051
10	Beachville	1927	1,268	336	181	11	61	1,857	2,730
		1925	641	207	90	1	84	1,023	1,108
		1926	1,082	287	126	15	80	1,590	1,826
		1927	1,320	271	196	29	55	1,871	2,830
11	Eastwood	1925	460	64	57	1	21	603	758
		1926	584	218	81	4	15	902	1,243
		1927	938	288	150	5	11	1,392	2,343
12	Concessions I and II, Brantford Township	1925	605	99	92	.....	17	813	1,251
		1926	849	192	113	.....	13	1,172	1,445
		1927	1,373	310	132	3	9	1,827	3,102
13	Cainsville	1925	1,078	164	164	4	104	1,514	2,004
		1926	1,230	309	295	14	86	1,934	2,651
		1927	1,714	353	266	15	62	2,410	4,264
14	Binkley's Corners	1925	1,301	87	244	.....	40	1,672	2,004
		1926	1,357	151	228	10	27	1,773	2,431
		1927	2,080	288	290	10	19	2,687	4,292
15	Burlington	1925	1,726	129	459	53	10	2,377	3,177
		1926	1,949	232	560	72	8	2,821	3,572
		1927	3,091	428	769	65	10	4,363	7,077
16	Oakville	1925	1,867	149	522	54	22	2,614	3,333
		1926	2,418	127	639	72	12	3,268	4,398
		1927	3,005	286	712	59	8	4,070	6,076

WINDSOR-QUEBEC BOUNDARY HIGHWAY

Highway No. 2

Traffic Census—Summer

DAILY AVERAGE

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
17	Long Branch.....	1925	6,958	985	926	207	57	9,133	10,089
		1926	6,349	1,559	780		57	9,016	13,352
		1927	7,166	1,639	976	260	53	10,094	13,085
18	Corner of Danforth Avenue and Markham Road..	1925	3,313	174	553	61	132	4,233	7,872
		1926	6,494	270	498	51	79	7,392	12,115
		1927	4,963	282	493	100	52	5,890	8,527
19	Junction of Old Kingston Road.....	1925	3,551	867	485	21	63	4,987	7,814
		1926	6,765	630	642	59	39	8,135	12,056
		1927	7,520	923	704	54	27	9,228	14,759
20	Westhill.....	1925	2,994	444	314	21	25	3,798	6,255
		1926	4,518	533	434	51	17	5,553	8,786
		1927	5,322	811	569	50	13	6,765	9,401
21	Courtice Corners.....	1925	1,148	378	111	23	21	1,981	2,896
		1926	2,164	410	119	25	25	2,743	3,981
		1927	2,097	571	154	29	15	2,866	5,088
22	Welcome Corners, Welcome-Port Hope Highway..	1925	865	358	45	6	48	1,322	1,732
		1926	1,556	382	70	7	54	2,069	3,289
		1927	1,250	549	88	7	53	1,947	3,003
23	East of Brighton.....	1925	644	315	47	1	53	1,060	1,320
		1926	Under construction						
		1927	847	466	59	2	17	1,391	1,959
24	West of Belleville, Lot 31, Con. 1, Sidney Township	1925	638	227	41	.....	30	936	1,336
		1926	1,241	260	77	6	29	1,613	2,040
		1927	1,452	416	97	10	27	2,002	2,667

WINDSOR-QUEBEC BOUNDARY HIGHWAY

Highway No. 2

Traffic Census—Fall

DAILY AVERAGE

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
17	Long Branch.....	1925	2,943	72	657	311	84	4,067	5,090
		1926	3,337	209	796	284	73	4,699	4,905
		1927	5,025	400	923	208	64	6,620	10,779
18	Corner of Danforth Avenue and Markham Road...	1925	1,923	25	537	102	197	2,784	3,679
		1926	4,386	36	725	176	302	5,625	8,058
		1927	3,776	66	545	106	52	4,545	8,401
19	Junction of Old Kingston Road.....	1925	2,096	25	371	19	23	2,544	3,939
		1926	3,441	117	522	43	46	4,169	6,409
		1927	3,504	175	505	56	28	4,268	8,496
20	West Hill.....	1925	1,358	33	341	22	19	1,773	2,620
		1926	1,740	48	324	38	17	2,167	3,231
		1927	3,921	162	574	57	10	4,724	9,716
21	Courtice Corners.....	1925	706	19	69	21	10	825	982
		1926	889	45	133	26	19	1,112	1,580
		1927	1,548	149	195	30	19	1,941	3,186
22	Welcome Corners, Port Hope-Welcome traffic.....	1925	370	9	96	4	72	551	723
		1926	441	22	53	5	51	572	748
		1927	1,160	121	109	9	44	1,443	2,366
23	East of Brighton.....	1925	381	17	93	1	75	567	644
		1926	Under construction						
		1927	801	185	115	3	67	1,171	1,390
24	West of Belleville, Lot 31, Con. 1, Sidney Township, moved to C.N.R. crossing east of Trenton in Fall, 1927.....	1925	516	8	56	67	104	751	773
		1926	615	20	55	7	28	725	890
		1927	1,202	108	145	14	30	1,499	1,947

WINDSOR-QUEBEC BOUNDARY HIGHWAY

Highway No. 2

Traffic Census—Summer

DAILY AVERAGE

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
25	East of Belleville at Pointe Anne Road.....	1925	1,025	301	46	5	24	1,401	1,760
		1926	1,077	319	60	11	29	1,496	1,910
		1927	1,046	501	80	9	15	1,651	2,484
26	Marysville.....	1925	467	301	29		47	844	1,033
		1926	644	332	32	.....	35	1,048	1,243
		1927	695	433	60	5	24	1,217	1,702
27	Lots 20, 21, Con. 1, Ernestown Township.....	1927	633	407	54	5	3	1,102	1,483
28	Cataraqui.....	1925	1,218	321	65	6	48	1,658	1,958
		1926	1,515	337	93	13	55	2,013	3,220
		1927	1,415	466	161	11	76	2,129	2,548
29	Barriefield.....	1925	761	363	62	10	33	1,229	1,458
		1926	984	363	71	7	36	1,460	1,749
		1927	918	457	106	6	17	1,504	1,839
30	Mallorytown, moved to Escott in Fall of 1927.....	1925	261	22	22	5	30	551	697
		1926	354	234	22	5	38	653	782
		1927	353	320	32	4	32	741	909
31	West of Brockville at Lynn Road.....	1925	706	281	41	11	29	1,068	1,412
		1926	866	332	54	5	33	1,290	1,779
		1927	765	406	85	5	39	1,300	1,595
32	East of Brockville, Lot 1, Con. 1, Elizabethtown Township.....	1925	534	230	71	11	34	880	1,110
		1926	844	301	79	12	30	1,266	1,773
		1927	1,028	395	88	10	25	1,546	1,974
33	Johnstown Corners.....	1925	353	222	23	6	17	621	824
		1926	457	244	32	4	13	750	1,116
		1927	510	323	44	4	13	894	1,298

WINDSOR-QUEBEC BOUNDARY HIGHWAY

Highway No. 2

Traffic Census—Fall

DAILY AVERAGE

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
25	East of Belleville at Pointe Anne Road.....	1925	497	17	37	6	23	580	775
		1926	593	19	67	12	20	711	1,000
		1927	835	139	89	6	21	1,090	1,503
26	Marysville.....	1925	281	15	27	2	374	442	442
		1926	339	37	36	4	26	442	636
		1927	549	115	47	5	15	731	1,112
27	Lots 20, 21, Ernestown Township.....	1927	498	121	49	5	6	679	1,029
28	Cataquaui Corner.....	1925	651	9	41	7	53	761	1,219
		1926	353	8	48	8	59	476	656
		1927	1,220	127	150	11	63	1,571	2,323
29	Barriefield.....	1925	342	23	39	7	32	443	648
		1926	414	42	39	7	25	527	858
		1927	618	110	65	7	16	816	1,124
30	Escott (5 miles west of Mallorytown the former station).....	1925	102	26	11	5	12	156	235
		1926	151	42	14	4	32	243	364
		1927	323	113	70	5	56	567	651
31	West of Brockville at Lynn Road.....	1925	182	7	27	3	24	243	345
		1926	322	45	29	5	24	425	707
		1927	683	112	69	9	32	905	1,443
32	East of Brockville, Lot 1, Con. 1, Elizabethtown Township.....	1925	289	25	43	10	32	399	670
		1926	455	44	62	12	19	592	908
		1927	660	218	84	11	23	996	1,325
33	Johnstown Corner.....	1925	107	43	13	3	18	184	223
		1926	Not taken						
		1927	344	103	34	4	14	499	776

WINDSOR-QUEBEC BOUNDARY HIGHWAY

Highway No. 2

Traffic Census—Summer

DAILY AVERAGE

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
34	Intersection of Morrisburg-Ottawa Highway at Morrisburg.....	1925	866	280	111	12	208	1,477	1,925
		1926	361	250	47	4	38	700	801
		1927	542	342	60	6	64	1,014	1,161
35	West limits of Cornwall.....	1925	796	262	140	5	164	1,367	1,516
		1926	1,086	429	122	5	118	1,760	2,574
		1927	1,589	477	221	5	170	2,462	3,011
36	Bainsville Sideroad.....	1925	151	244	26	.....	25	446	636
		1926	206	309	17	1	25	558	921
		1926	424	428	46	2	45	945	1,363
		1927							

WINDSOR-QUEBEC BOUNDARY HIGHWAY

Highway No. 2

Traffic Census—Fall

DAILY AVERAGE

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
34	Morrisburg.....	1925	256	32	42	7	84	421	519
		1926	343	52	32	7	55	489	576
		1927	851	159	89	14	110	1,223	1,497
35	West limits of Cornwall.....	1925	569	38	87	4	119	817	1,191
		1926	586	64	105	4	110	869	1,189
		1927	1,326	188	239	6	194	1,953	2,448
36	Bainsville Sideroad moved to Lancaster in Fall 1927	1925	80	33	14	1	23	151	217
		1926	131	46	12	.....	38	227	324
		1926	323	178	46	1	44	592	916
		1927							

WINDSOR-NIAGARA FALLS HIGHWAY

Highway No. 3

Traffic Census—Summer

DAILY AVERAGE

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
	South of Windsor at Howard Ave.	1925	972	640	102	4	9	1,727	2,654
		1926	1,795	173	529	24	131	2,652	3,425
		1927	2,165	1,373	328	11	16	3,893	5,140
1	Maidstone.	1925	1,009	745	181	11	22	1,968	2,637
		1926	1,574	861	237	14	30	2,716	3,881
		1927	2,361	1,736	259	13	27	4,396	8,956
2	North of Cottam.	1925	587	501	102	1	17	1,208	2,448
		1926	1,150	680	127	14	16	1,987	2,898
		1927	1,247	566	134	.....	12	1,959	4,749
3	Cedar Springs.	1925	572	330	59	2	14	977	1,825
		1926	959	463	89	3	33	1,548	2,023
		1927	706	67	66	.....	29	868	1,236
4	Morpeth.	1925	552	420	43	.....	23	1,038	1,534
		1926	722	423	57	8	50	1,260	1,616
		1927	736	110	136	6	36	1,024	1,509
5	Wallacetown.	1925	428	416	17	.....	11	872	1,262
		1926	526	335	26	1	11	898	1,208
		1927	228	45	12	.....	11	296	624
6	Talbotville.	1925	533	376	42	.....	33	984	1,360
		1926	659	250	36	1	10	955	1,316
		1927	430	44	35	.....	11	520	760
7	New Sarum.	1925	726	97	40	.....	19	882	1,454
		1926	865	108	42	9	21	1,055	1,239
		1927	991	78	51	8	24	1,152	1,892

WINDSOR-NIAGARA FALLS HIGHWAY

Highway No. 3

Traffic Census—Fall

DAILY AVERAGE

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
1	South of Windsor at Howard Ave.	1925	1,160	50	192	37	60	1,499	1,515
		1926	1,500	17	378	2	56	1,953	2,246
		1927	1,687	711	266	21	10	2,695	4,970
		1925	766	99	125	11	20	1,021	1,630
2	North of Cottam.	1926	1,268	321	179	8	54	1,830	3,035
		1927	1,882	831	266	14	71	3,064	5,972
		1925	240	19	45	10	17	331	45
		1926	683	122	97	8	34	944	1,551
3	Cedar Springs.	1927	850	197	140	1	23	1,211	2,309
		1925	259	13	44	4	24	344	401
		1926	503	88	90	4	39	724	866
		1927	556	42	96	4	33	731	1,035
4	Morpeth.	1925	255	10	30	1	26	322	567
		1926	376	51	40	6	38	511	614
		1927	666	91	69	6	60	892	1,031
		1925	145	13	14	.....	23	195	274
5	Wallacetown.	1926	219	53	19	.....	12	303	406
		1927	235	40	17	.....	18	310	552
		1925	Under construction	.....	.....	.....	.....	.....	.....
		1926	348	11	31	.....	21	411	611
6	Talbotville.	1927	559	29	51	1	20	660	1,057
		1925	418	4	40	.....	20	482	726
		1926	640	15	38	7	23	723	1,046
		1927	741	19	41	7	14	822	1,319

WINDSOR-NIAGARA FALLS HIGHWAY

Highway No. 3

Traffic Census—Summer

DAILY AVERAGE

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
8	Bayham Road.....	1925	139	69	8	.....	9	225	324
		1926	223	98	15	5	10	351	442
		1927	263	63	29	8	14	377	634
9	Courtland.....	1925	336	80	44	.....	65	525	695
		1926	477	96	61	8	77	719	851
		1927	505	64	82	7	50	708	1,018
10	Renton.....	1925	253	62	21	.....	30	366	427
		1926	342	110	144	9	30	635	739
		1927	456	88	65	6	19	634	1,071
11	Jarvis.....	1925	346	57	37	.....	41	481	555
		1926	652	94	63	8	67	884	1,106
		1927	841	97	102	7	74	1,121	1,515
12	Nelles Corners.....	1925	321	94	39	4	27	485	604
		1926	390	120	55	1	13	580	738
		1927	363	109	42	.....	16	530	745
13	Canboro Corners.....	1925	350	94	37	7	25	513	744
		1926	439	119	42	6	20	626	982
		1927	414	150	40	6	11	621	1,202
14	At Forks Road, Lot 30 and 40, Wainfleet Township	1925	351	137	49	3	19	559	996
		1926	683	200	59	5	18	965	1,758
		1927	687	247	81	4	20	1,039	1,973
15	Chambers Corners.....	1927	769	329	104	5	29	1,236	2,769
17	West of Niagara Falls at Montrose Road.....	1925	1,445	307	163	8	62	1,984	3,350
		1926	1,069	319	156	5	57	1,606	2,271
		1927	1,741	622	224	18	23	2,628	3,603

WINDSOR-NIAGARA FALLS HIGHWAY

Highway No. 3

Traffic Census—Fall

DAILY AVERAGE

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
8	Bayham Road.....	1925	56	3	6	.....	8	73	105
		1926	128	15	9	8	9	169	263
		1927	290	30	29	6	16	371	686
9	Courtland.....	1925	249	5	34	.....	102	390	491
		1926	331	12	55	8	59	465	589
		1927	456	34	75	9	40	614	903
10	Renton.....	1925	191	4	15	.....	43	253	318
		1926	342	16	32	7	30	427	739
		1927	445	25	63	10	16	559	852
11	Jarvis.....	1925	386	2	63	5	83	539	684
		1926	503	7	87	8	107	712	845
		1927	732	12	126	6	63	939	1,221
12	Nelles Corners.....	1925	227	10	33	6	26	302	374
		1926	272	28	46	1	24	371	457
		1927	329	47	71	.....	29	476	603
13	Canboro Corners.....	1925	182	16	34	7	30	269	379
		1926	220	41	25	6	26	318	435
		1927	395	79	46	6	27	553	997
14	Junction of Forks Road, Lots 39, 40, Wainfleet Township.....	1925	264	32	41	4	23	364	464
		1926	303	43	46	4	17	413	531
		1927	639	144	78	5	24	890	1,750
15	Chambers Corners.....	1927	518	112	83	4	13	730	1,574
16	At Fonthill Road.....	1927	1,067	86	174	3	20	1,350	2,568
17	At Montrose Road.....	1925	723	64	120	6	54	967	1,072
		1926	427	19	108	6	34	594	796
		1927	1,199	210	202	8	53	1,672	2,959

CHAMBERS CORNERS-FORT ERIE HIGHWAY

Highway No. 3a

Traffic Census—Summer

DAILY AVERAGE

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
1	Chambers Corners.....	1927	193	47	35	1	16	292	673
2	At Lot 1, Con. 1, Wainfleet Township.....	1925	854	348	132	1	110	1,445	2,354
		1926	907	384	151	2	45	1,489	2,052
3	At Ridgeway Road.....	1927	772	367	117	2	46	1,304	2,240
		1925	506	1,892	88	31	15	2,532	3,055
		1926	1,037	2,008	106	22	14	3,187	4,178
		1927	657	4,474	132	34	30	5,327	7,975

CHAMBERS CORNERS-FORT ERIE HIGHWAY

Highway No. 3a

Traffic Census—Fall

DAILY AVERAGE

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
1	Chambers Corners.....	1927	293	82	48	.....	6	429	921
2	At Lot 1, Con. 1, Wainfleet Township.....	1925	355	39	108	2	63	567	692
		1926	526	135	120	.....	77	858	1,147
3	At Ridgeway Road.....	1927	562	97	111	.....	48	818	1,395
		1925	703	305	53	23	29	1,113	1,599
		1926	551	264	74	30	16	935	1,196
		1927	727	799	115	34	12	1,687	2,740

ST. THOMAS-CLINTON HIGHWAY
 Traffic Census—Summer
 DAILY AVERAGE
 Highway No. 4

Station	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
1	Talbotville.....	1925 1926 1927	928 1,902 1,361	144 420 165	65 97	..... 1	15 24	1,152 2,444 1,636	1,830 3,183 3,009
2	Lambeth.....	1925 1926 1927	1,625 2,129 1,945	580 433 253	171 131 157	..... 6 4	33 19	2,415 2,716 2,374	3,748 3,717 4,095
3	North of London, Cons. 4 and 5, London Township	1925 1926 1927	1,221 1,059 991	482 109 70	107 88 91	2 9 10	17 34 32	2,374 1,854 1,299	3,022 1,809 1,542
4a	Elginfield (London traffic).....	1925 1926 1927	243 640 359	25 57 30	12 35 20	3 11 7	9 11 6	292 754 422	483 1,119 713
4b	Elginfield (Clinton traffic).....	1925 1926 1927	217 402 278	23 32 16	15 25 15	1 2 1	16 17 14	272 478 324	409 608 580
5	Brucefield.....	1925 1926 1927	281 443 399	15 24 38	23 48 31	..... ..... .....	29 41 44	348 556 512	500 852 656

ST. THOMAS-CLINTON HIGHWAY

Highway No. 4

Traffic Census—Fall

DAILY AVERAGE

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
1	Talbotville.....	1925	505	5	56	.....	31	597	684
		1926	878	21	72	1	27	999	1,369
		1927	808	32	76	.....	12	928	1,559
2	Lambeth.....	1925	764	20	87	3	21	902	1,199
		1926	1,397	63	137	5	19	1,621	2,195
		1927	1,338	124	134	4	25	1,625	2,903
3	North of London, Cons. 4 and 5, London Township	1925	581	12	57	5	29	684	867
		1926	712	13	97	8	29	859	1,112
		1927	1,285	40	148	15	40	1,528	2,514
4a	Elginfield (London traffic).....	1925	142	2	8	3	14	169	207
		1926	273	3	18	8	16	318	474
		1927	664	9	45	9	8	735	1,259
4b	Elginfield (Clinton traffic).....	1925	133	2	9	2	21	167	203
		1926	207	2	15	2	20	246	345
		1927	355	2	27	2	14	400	605
5	Brucefield.....	1925	156	1	13	.....	46	216	275
		1926	237	7	33	.....	53	330	380
		1927	361	13	34	.....	52	460	613

WALKERTON-DURIHAM HIGHWAY

Highway No. 4a

Traffic Census—Summer

DAILY AVERAGE

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
1	At Chesley Road.....	1925	244	15	26	3	38	326	651
		1926	486	18	24	2	46	576	653
		1927	592	21	35	4	38	690	1,236

WALKERTON-DURHAM HIGHWAY

Highway No. 4a

Traffic Census—Fall

DAILY AVERAGE

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
1	At Chesley Road.....	1925	88	.....	5	.....	41	134	205
		1926	128	.....	5	.....	47	180	243
		1927	400	4	24	5	39	472	762

TORONTO TO HIGHWAY No. 8

Traffic Census—Summer

DAILY AVERAGE

Highway No. 5

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
1	Islington.....	1925	3,592	196	412	25	15	4,240	6,253
		1926	5,558	189	461	33	12	6,253	9,523
		1927	4,285	273	493	25	8	5,084	6,871
2	Cooksville.....	1925	4,062	247	520	25	39	4,893	7,914
		1926	5,791	270	554	47	36	6,698	10,856
		1927	5,936	380	606	24	19	6,965	10,892
3	Trafalgar.....	1925	1,705	192	143	5	12	2,057	3,411
		1926	2,353	219	141	12	11	2,736	4,538
		1927	2,318	271	188	7	7	2,791	4,999
4	Brant Street.....	1925	1,095	158	59	7	4	1,323	2,184
		1926	1,900	198	101	10	6	2,215	3,598
		1927	1,651	270	138	7	5	2,071	3,390
5	Clappison's Corners, traffic east of.....	1925	1,371	163	116	7	11	1,668	2,631
		1926	2,085	174	123	11	6	2,399	3,893
		1927	1,897	222	171	7	8	2,305	3,771
6	Clappison's Corners, traffic west of.....	1925	274	10	26	.....	10	320	428
		1926	442	19	40	.....	7	508	678
		1927	346	13	44	.....	8	411	621

TORONTO TO HIGHWAY No. 8

Traffic Census—Fall

Highway No. 5

DAILY AVERAGE

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
1	Islington.....	1925	2,067	42	381	15	13	2,518	3,653
		1926	2,226	77	383	17	7	2,710	4,275
		1927	5,020	121	839	46	30	6,056	11,455
2	Cooksville.....	1925	3,232	39	621	32	36	3,960	6,506
		1926	3,251	82	595	26	28	3,982	5,466
		1927	4,791	132	653	19	21	5,616	11,556
3	Trafalgar.....	1925	1,091	27	106	6	8	1,238	1,738
		1926	1,413	62	174	9	17	1,675	2,301
		1927	2,251	99	207	9	5	2,571	5,065
4	Brant Street.....	1925	848	33	74	6	8	969	1,343
		1926	1,172	52	97	7	16	1,344	1,883
		1927	1,771	102	125	7	7	2,012	3,758
5	Clappison's Corners., traffic east of.....	1925	1,043	25	115	6	13	1,202	1,609
		1926	1,357	36	136	9	9	1,547	2,143
		1927	2,492	71	231	10	6	2,810	5,140
6	Clappison's Corners, traffic west of.....	1925	254	3	53	.....	14	324	374
		1926	275	2	34	.....	10	321	367
		1927	513	8	65	.....	6	592	1,126

PORT DOVER-OWEN SOUND HIGHWAY, Via Hamilton

Highway No. 6

Traffic Census—Summer

DAILY AVERAGE

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
1	Jarvis, traffic south of	1925	327	62	38	.....	44	471	657
		1926	211	13	14	6	34	278	361
		1927	280	36	45	3	32	396	670
2	Jarvis, traffic north of	1925	377	26	38	5	33	479	634
		1926	505	23	43	12	42	625	834
		1927	742	62	106	10	55	975	1,347
3	At Oshweken Road	1926	506	20	59	14	25	624	869
		1927	641	66	130	13	17	867	1,641
4	Concessions 6 and 7, Glanford Township	1925	Closed to traffic						
		1926	967	45	113	20	28	1,173	1,756
		1927	1,041	77	149	17	23	1,307	2,502
5	Clappison's Corners	1925	1,470	192	185	15	39	1,901	3,065
		1926	2,503	204	195	24	19	2,945	4,682
		1927	2,476	266	242	19	19	3,022	4,907
6	Freelton	1925	503	38	59	8	27	635	1,075
		1926	1,140	68	95	14	28	1,345	2,289
		1927	920	69	121	15	17	1,142	2,150
7	South of Guelph, lots 6 and 7, Puslinch	1925	584	73	66	8	14	745	1,388
		1926	1,231	125	119	11	42	1,528	2,517
		1927	1,239	108	150	13	32	1,542	2,670
8	North of Guelph at Elora Road	1925	797	31	50	4	35	917	1,457
		1926	1,044	62	106	7	25	1,244	1,831
		1927	915	47	65	6	18	1,051	1,720

PORT DOVER-OWEN SOUND HIGHWAY, Via Hamilton

Highway No. 6

Traffic Census—Fall

DAILY AVERAGE

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
1	Jarvis, traffic south of.....	1925	68	.....	9	1	31	109	137
		1926	68	.....	13	.....	43	124	163
		1927	168	4	20	4	24	220	337
2	Jarvis, traffic north of.....	1925	354	1	42	10	74	481	600
		1926	442	3	65	8	79	597	752
		1927	639	10	100	8	44	801	1,039
3	At Oshweken Road.....	1926	336	5	62	12	24	439	536
		1927	605	11	148	12	17	793	1,235
4	Concessions 6 and 7, Glanford Township.....	1925	Closed to traffic						
		1926	555	9	92	18	35	709	1,045
		1927	829	13	152	19	30	1,043	1,819
5	Clappison's Corners.....	1925	1,043	25	115	6	13	1,202	1,609
		1926	1,357	36	136	9	9	1,547	2,143
		1927	2,907	79	310	21	20	3,337	6,282
6	Freelton.....	1925	488	10	87	10	33	628	892
		1926	583	25	116	12	30	766	959
		1927	825	29	139	14	17	1,024	2,076
7	South of Guelph, Lots 6 and 7, Puslinch Township..	1925	696	6	100	8	54	864	1,161
		1926	769	29	138	12	66	1,014	1,287
		1927	1,086	26	181	12	39	1,344	2,588
8	North of Guelph at Elora Road.....	1925	437	5	39	4	32	517	718
		1926	619	9	57	4	33	722	982
		1927	821	17	84	5	20	947	1,814
9	South of Arthur.....	1925	178	2	10	.....	115	305	351
		1926	348	3	23	4	125	503	640
		1927	533	13	46	4	98	694	1,140

PORT DOVER-OWEN SOUND HIGHWAY

Highway No. 6

Traffic Census—Summer

DAILY AVERAGE

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
9	South of Arthur.....	1925	401	18	21	.....	130	570	871
		1926	1,126	34	32	4	151	1,347	2,683
		1927	517	32	31	4	99	683	1,033
10	South of Durham.....	1925	251	15	16	.....	32	314	453
		1926	370	24	21	5	24	444	529
		1927	354	25	27	4	24	434	663
11	Chatsworth Corners (Guelph traffic).....	1925	355	14	15	.....	46	430	648
		1926	381	20	16	4	33	454	638
		1927	440	24	22	4	33	523	671

PORT DOVER-OWEN SOUND HIGHWAY

Highway No. 6

Traffic Census—Fall

DAILY AVERAGE

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
10	South of Durham.....	1925	110	1	6	.....	38	155	163
		1926	188	4	9	4	27	232	317
		1927	350	8	21	4	25	408	691
11	Chatsworth Corners (Guelph traffic).....	1925	169	.....	9	.....	41	219	323
		1926	234	2	20	4	34	294	405
		1927	529	4	39	4	45	621	745

SARNIA-PETERBOROUGH HIGHWAY, Via Stratford and Brampton

Highway No. 7

Traffic Census—Summer

DAILY AVERAGE

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
1	At Wyoming Road.....	1925	228	518	20	1	28	795	1,125
		1926	659	874	28	2	34	1,597	2,028
		1927	476	418	24	4	12	934	1,609
2	West of Wisbeach.....	1925	57	95	5	2	3	162	252
		1926	112	136	8	3	1	260	383
		1927	112	97	11	1	2	223	394
3	West of Parkhill at Kerwood Road.....	1925	202	118	16	1	22	359	565
		1926	269	153	19	2	28	471	549
		1927	411	124	34	2	37	608	726
4	Parkhill.....	1927	601	174	65	6	119	965	1,385
5a	Elginfield (to Sarnia traffic).....	1925	91	72	5	.....	6	174	245
		1926	173	83	7	.....	5	268	429
		1927	125	35	5	.....	4	169	338
5b	Elginfield (to Stratford traffic).....	1925	128	75	8	2	12	225	313
		1926	325	82	13	10	13	443	687
		1927	208	61	9	6	11	295	550
6	West of St. Mary's.....	1925	415	69	38	1	48	571	898
		1926	589	86	40	9	44	768	1,087
		1927	569	59	60	6	45	739	988
7	South of Stratford.....	1925	915	130	56	.....	73	1,174	2,034
		1926	965	94	56	8	67	1,190	1,624
		1927	900	77	78	7	46	1,108	1,667

SARNIA-PETERBOROUGH HIGHWAY, Via Stratford and Brampton

Highway No. 7

Traffic Census—Fall

DAILY AVERAGE

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
1	At Wyoming Road.....	1925	158	80	17	.....	36	291	387
		1926	419	166	19	2	30	636	1,021
		1927	565	180	35	4	40	824	1,681
2	West of Wisbeach.....	1925	37	24	5	1	4	71	96
		1926	70	51	10	3	4	138	198
		1927	222	121	21	2	4	370	419
3	West of Parkhill at Kerwood Road.....	1925	137	18	13	.....	42	210	269
		1926	173	42	19	2	51	287	537
		1927	320	80	34	4	45	483	647
4	Parkhill.....	1927	541	55	39	5	80	720	894
5a	Elginfield (to Sarnia traffic).....	1925	66	10	2	.....	4	82	106
		1926	130	8	5	.....	5	148	235
		1927	181	11	11	.....	3	206	363
5b	Elginfield (to Stratford traffic).....	1925	96	9	4	2	15	126	151
		1926	166	8	9	7	12	202	311
		1927	367	14	23	8	11	423	781
6	West of St. Mary's.....	1925	338	4	29	4	76	451	692
		1926	417	6	37	9	60	529	702
		1927	624	28	58	14	39	763	1,258
7	South of Stratford.....	1925	373	10	42	.....	66	491	552
		1926	544	8	54	7	51	664	954
		1927	774	29	70	6	51	930	1,613
8	Shakespeare.....	1925	428	1	30	.....	41	500	647
		1926	612	6	59	6	38	721	1,239
		1927	1,188	37	120	6	36	1,387	2,683

SARNIA-PETERBOROUGH HIGHWAY, Via Stratford and Brampton

Highway No. 7

Traffic Census—Summer

DAILY AVERAGE

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
8	Shakespeare.....	1925	659	81	37	1	24	802	1,545
		1926	943	73	62	8	23	1,109	1,634
9	West of Baden.....	1927	1,266	88	100	6	43	1,503	2,471
		1925	250	13	27	.....	36	326	635
		1926	1,000	105	71	7	34	1,217	1,824
10	East of Kitchener at Breslau Rd.....	1927	878	79	99	6	12	1,074	2,014
		1925	618	64	46	.....	35	763	1,073
		1926	758	25	60	10	23	876	1,273
11	West of Guelph, Concessions 4 and 5, Guelph Twp.....	1927	539	15	72	9	17	652	962
		1925	391	58	39	.....	6	494	717
		1926	448	33	42	10	24	557	817
12	East of Guelph, Lot 11, Concession 2, Guelph.....	1927	607	30	68	9	14	728	946
		1925	671	25	63	.....	41	800	1,385
		1926	888	32	64	10	29	1,023	1,358
13	At Brampton-Owen Sound Highway.....	1927	840	19	64	7	16	946	1,248
		1925	255	11	15	.....	8	289	563
		1926	311	2	27	4	22	366	553
14	Langstaff, Yonge Street Cor.....	1927	Closed to traffic	.....	.....	.....	.....	.....	.....
		1925	400	10	55	1	18	484	859
		1926	781	10	77	2	32	902	1,792
15	South of Brooklin at Highway No. 12.....	1927	600	14	157	.....	13	784	1,237
		1925	231	11	21	.....	19	282	460
		1926	Under construction	.....	.....	.....	.....	.....	.....
		1927	239	4	26	.....	23	292	485

SARNIA-PETERBOROUGH HIGHWAY, Via Stratford and Brampton

Highway No. 7

Traffic Census—Fall

DAILY AVERAGE

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
9	West of Baden.....	1925	311	4	29	.....	34	378	529
		1926	632	22	57	5	20	736	1,159
		1927	725	29	98	8	16	876	1,650
		1925	257	1	22	.....	32	312	396
10	East of Kitchener at Breslau Road.....	1926	Not taken						
		1927	Not taken						
		1925	199	3	27	.....	21	250	367
		1926	324	10	38	13	13	398	515
11	West of Guelph, Concessions 4 and 5, Guelph Twp..	1926	324	10	38	13	13	398	515
		1927	292	3	50	8	11	364	582
		1925	403	6	60	.....	44	513	605
		1926	500	9	68	6	18	601	823
12	East of Guelph, Lot 11, Concession 2, Guelph Twp..	1927	526	5	62	5	20	618	1,168
		1925	231	1	42	.....	33	307	345
		1926	301	.....	74	4	22	401	547
		1927	660	3	92	8	12	775	1,898
13	At Brampton-Owen Sound Highway.....	1925	268	1	62	.....	24	355	497
		1926	282	2	105	.....	16	405	506
		1927	1,171	6	148	.....	22	1,347	2,706
		1925	123	.....	22	.....	31	176	204
14	Langstaff, Yonge Street Corner.....	1926	Under construction						
		1927	277	2	53	.....	20	352	610
		1925	160	.....	10	.....	22	192	228
		1926	238	.....	19	3	29	289	376
15	South of Brooklin at Highway No. 12.....	1926	324	5	18	3	43	393	710
		1927							
16	West of Lindsay, Lot 12, 13, Brock Township.....	1925							
		1926							
		1926							
		1927							

SARNIA-PETERBOROUGH HIGHWAY, Via Stratford and Brampton

Highway No. 7

Traffic Census—Summer

DAILY AVERAGE

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
16	West of Lindsay, Lots 12, 13, Brock Township.....	1925	332	25	7	.....	18	382	647
		1926	605	19	14	3	15	656	1,208
		1927	532	34	21	2	21	610	1,134
17	West limits of Lindsay.....	1925	572	28	38	.....	43	681	1,016
		1926	756	27	39	4	28	854	1,159
		1927	740	61	57	4	44	906	1,282
18	South of Lindsay at Newcastle Road.....	1925	541	14	37	.....	60	652	986
		1926	448	11	32	.....	32	523	704
		1927	379	24	45	.....	25	473	727
19	At the intersection of Chemong Rd. (traffic west of Chemong Rd.).....	1925	200	10	19	.....	5	234	411
		1926	228	27	24	.....	3	282	430
		1927	271	34	22	.....	8	335	409
20	At intersection of Chemong Rd. (traffic south of Chemong Rd.).....	1925	870	53	76	15	26	1,040	1,514
		1926	748	65	62	13	18	906	1,281
		1927	809	72	56	3	27	967	1,228

SARNIA-PETERBOROUGH HIGHWAY, Via Stratford and Brampton

Highway No. 7

Traffic Census—Fall

DAILY AVERAGE

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
17	West limits of Lindsay.....	1925	275	2	23	.....	27	327	475
		1926	407	2	33	3	32	477	678
		1927	669	6	68	4	33	780	1,147
18	South limits of Lindsay.....	1925	230	1	24	.....	33	288	421
		1926	407	.....	29	.....	36	472	599
		1927	291	.....	28	.....	20	339	559
19	At the intersection of Chemong Rd. (traffic west of Chemong Rd.).....	1925	100	.....	17	.....	5	130	204
		1926	141	4	36	1	24	206	262
		1927	205	7	25	.....	1	238	458
20	At the intersection of Chemong Rd. (traffic south of Chemong Rd.).....	1925	251	.....	47	.....	23	321	500
		1926	337	8	80	2	62	489	657
		1927	578	19	64	.....	17	678	1,230

Traffic Census—Summer

DAILY AVERAGE

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
1	South End Corner.....	1925	2,125	2,065	400	48	56	4,694	6,050
		1926	2,287	2,088	293	69	39	4,776	7,423
		1927	2,505	2,567	299	67	43	5,481	8,399
2a	St. David's (Niagara Falls traffic)	1925	1,593	1,670	173	20	17	3,473	5,070
		1926	2,079	2,097	210	36	16	4,438	8,003
		1927	1,737	2,095	182	43	5	4,062	7,018
2b	St. David's (St. Catharines traffic)	1925	1,803	1,897	177	23	37	3,937	5,618
		1926	2,228	2,291	236	40	28	4,823	8,055
		1927	1,919	2,255	169	87	14	4,444	7,856
3	Jordan Corners.....	1925	1,803	1,481	266	32	19	3,601	5,448
		1926	2,528	1,603	241	42	4	4,420	7,044
		1927	2,244	2,071	318	44	15	4,690	7,385
4	At. Grimsby Park Road.....	1925	2,365	1,800	303	31	42	4,541	7,037
		1926	4,209	2,197	361	46	28	6,841	11,593
		1927	2,439	1,893	381	33	35	4,781	8,301
5	At Stoney Creek Road.....	1925	2,765	1,806	324	34	12	4,941	7,157
		1926	3,877	1,876	410	55	13	6,231	9,735
		1927	3,549	2,218	422	43	16	6,248	10,896
6	Binkley's Corner.....	1925	2,201	220	327	133	59	2,940	3,647
		1926	2,391	207	356	139	47	3,140	3,956
		1927	2,681	242	378	155	30	3,486	4,039
7	Bullock's Corner.....	1925	1,335	116	176	14	47	1,688	2,521
		1926	1,401	136	167	15	46	1,765	2,687
		1927	1,338	105	233	14	26	1,716	2,921
8	East of Sebringville at St. Mary's Rd.....	1925	872	47	46	.....	42	1,007	1,709
		1926	1,054	43	53	1	53	1,204	1,516
		1927	1,127	41	69	.....	41	1,278	2,014
9	South of Seaforth at Tuckersmith-Hibbert Town- line, moved southeast to Dublin in 1927.....	1925	304	15	24	2	56	401	572
		1926	365	9	23	1	53	451	751
		1927	419	26	36	.....	103	584	935
10	South of Goderich at Lot 9, Concession A, Township of Goderich.....	1925	421	21	17	1	24	484	722
		1926	Under con- struction	.....	.....	.....	.....	.....	.....
		1927	325	31	22	.....	29	407	733

Traffic Census—Fall

DAILY AVERAGE

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
1	South End Corner.....	1925	989	409	302	42	49	1,791	2,438
		1926	1,340	579	334	57	50	2,360	3,287
		1927	2,449	1,114	535	88	40	4,226	6,219
2a	St. Davids (Niagara Falls traffic).....	1925	786	297	144	15	11	1,253	2,085
		1926	1,043	319	248	34	29	1,673	2,039
		1927	1,432	868	257	60	9	2,626	4,604
2b	St. David's (St. Catharines traffic).....	1925	833	322	157	15	25	1,352	2,348
		1926	1,076	365	238	36	25	1,740	2,533
		1927	1,475	946	236	50	8	2,715	4,872
3	Jordan Corners.....	1925	895	203	188	32	9	1,327	1,950
		1926	1,197	407	400	34	35	2,073	2,897
		1927	1,752	787	466	40	29	3,074	5,344
4	At Grimsby Park Road.....	1925	928	270	241	24	13	1,476	2,079
		1926	1,330	573	384	31	26	2,344	3,094
		1927	1,829	759	402	30	30	3,050	5,505
5	Jct. of Stoney Creek Road.....	1925	1,314	217	259	26	12	1,828	2,753
		1926	1,819	366	465	46	23	2,719	3,586
		1927	2,358	1,196	522	40	17	4,132	7,895
6	Binkley's Corner.....	1925	1,529	26	212	106	37	1,910	2,547
		1926	1,744	35	322	136	48	2,285	3,166
		1927	2,402	55	318	140	33	2,948	4,212
7	Bullock's Corner.....	1925	842	20	159	13	54	1,088	1,279
		1926	1,173	40	209	14	46	1,482	2,019
		1927	1,703	44	295	14	36	2,092	3,424
8	East of Sebringville at St. Mary's Road.....	1925	549	1	35	2	54	641	791
		1926	769	6	51	.....	56	882	1,202
		1927	1,004	9	76	.....	41	1,130	1,846
9	Dublin.....	1925	158	.....	16	2	42	218	385
		1926	295	1	54	1	65	416	534
		1927	443	8	53	2	64	570	900
10	South of Goderich at Lot 9, Concession A, Goderich Township.....	1925	Under construction		14	.....	34	289	488
		1926	239	2	37	.....	37	516	1,139
		1927	432	8	.....	2	.....	.....	.....

BURLINGTON BEACH HIGHWAY

Highway No. 8A

Traffic Census—Summer

DAILY AVERAGE

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
1	At intersection of Beach Road.....	1925	2,654	537	208	2	51	3,452	5,008
		1926	5,040	1,042	335	11	26	6,454	10,962
		1927	4,319	701	291	12	35	5,358	10,193
2	Beach Road at intersection of Burlington Beach Highway.....	1925	1,539	150	162	1	45	1,897	2,105
		1926	3,534	347	258	3	36	4,178	7,483
		1927	1,737	88	175	2	51	2,053	2,156

Highway No. 8A

BURLINGTON BEACH HIGHWAY

Traffic Census—Fall

DAILY AVERAGE

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
1	At intersection of Beach Road.....	1925	853	74	159	1	28	1,115	2,268
		1926	Under Construction	32	170	1	29	1,088	1,603
		1927	856		121	.....	43	810	1,039
2	Beach Road at intersection of Burlington Beach Highway.....	1925	624	22	213	10	20	1,870	4,264
		1926	Under construction	225					
		1927	1,402						

ARTHUR-KINCARDINE HIGHWAY
Traffic Census—Summer
DAILY AVERAGE

Highway No. 9

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
1	South of Arthur.....	1925	215	3	8	.....	72	298	424
		1926	436	7	13	.....	99	555	981
		1927	190	5	10	.....	41	246	370
2	Teviotdale.....	1925	80	1	5	.....	7	93	178
		1926	366	19	21	.....	16	422	669
		1927	414	29	34	.....	20	497	795
3	West limits of Clifford Village.....	1925	322	21	29	.....	82	455	612
		1926	397	20	23	1	55	495	666
		1927	394	20	37	.....	51	502	906
4	Kinloss.....	1925	146	13	7	.....	17	183	298
		1926	207	13	13	.....	12	245	372
		1927	195	11	20	.....	18	244	320

ARTHUR-KINCARDINE HIGHWAY

Highway No. 9

Traffic Census—Fall

DAILY AVERAGE

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
1	South of Arthur.....	1925	49	.....	2	1	31	83	99
		1926	143	6	.....	.....	63	212	289
		1927	209	3	18	.....	33	263	445
2	Teviotdale.....	1925	93	1	7	.....	106	207	256
		1926	162	6	10	.....	9	187	271
		1927	306	7	25	.....	17	355	635
3	North limits of Clifford Village.....	1925	175	1	13	.....	73	262	305
		1926	200	2	19	.....	46	287	408
		1927	295	5	36	.....	36	372	610
4	Kinloss.....	1925	39	.....	2	.....	13	54	76
		1926	90	.....	8	.....	11	109	154
		1927	166	3	15	.....	13	197	257

PORT CREDIT-CHATSWORTH HIGHWAY
Traffic Census—Summer
DAILY AVERAGE
Highway No. 10

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
1	Cooksville Corner.....	1925	2,187	65	255	13	27	2,547	4,483
		1926	3,181	66	298	35	35	3,615	8,057
		1927	3,023	126	356	28	18	3,551	5,732
2	Junction of Brampton-Guelph Highway.....	1925	555	25	55	.....	18	653	963
		1926	886	4	70	.....	26	988	1,705
		1927	887	33	118	8	11	1,057	1,754
3	North of Orangeville.....	1925	471	13	27	.....	46	557	791
		1926	624	12	37	.....	34	707	963
		1927	732	26	47	.....	39	844	1,188
4	North of Shelburne.....	1925	313	9	110	.....	25	457	587
5	Flesherton.....	1925	628	19	30	.....	72	760	933
		1926	786	19	53	11	65	936	1,128
		1927	Under construction			13			
		1925	141	4	6	.....	28	179	287
		1926	173	7	8	.....	13	201	287
6	Chatsworth Cor. (Orangeville traffic).....	1927	227	8	10	.....	11	256	346

PORT CREDIT-CHATSWORTH HIGHWAY

Highway No. 10

Traffic Census—Fall

DAILY AVERAGE

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
1	Cooksville Corner.....	1925	1,847	17	267	14	28	2,173	3,949
		1926	1,565	18	296	17	24	1,920	2,777
2	At Brampton-Guelph Highway.....	1927	1,653	24	362	20	15	2,074	2,670
		1925	385	.....	69	.....	33	487	573
		1926	443	.....	74	4	20	541	744
3	North of Orangeville.....	1927	875	3	153	6	16	1,053	1,684
		1925	248	1	16	.....	62	327	392
		1926	318	.....	23	.....	36	377	472
4	North of Shelburne.....	1927	477	2	56	1	28	564	942
5	Flesherton.....	Under construction	.....	.....	.....	.....	.....	.....	.....
		1925	281	.....	27	10	78	396	520
		1926	Under construction	.....	.....	.....	.....	.....	.....
		1927	Under construction	.....	.....	.....	.....	.....	.....
		1925	57	.....	2	.....	35	94	155
6	Chatsworth Corners (Orangeville traffic).....	1926	115	1	11	.....	19	146	243
		1927	333	.....	24	.....	42	399	673

TORONTO-SEVERN HIGHWAY
Traffic Census—Summer
DAILY AVERAGE
Highway No. 11

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
0	Lansing Corner.....	1925	3,754	530	583	2	56	4,925	6,613
		1926	5,366	282	417	21	47	6,133	8,601
		1927	5,070	409	527	10	27	6,043	10,365
1	Langstaff Corner.....	1925	3,094	245	270	2	19	3,630	6,017
		1926	4,796	302	298	13	26	5,435	8,930
		1927	4,475	323	409	11	15	5,233	9,674
2	Top of South Holland Landing Hill.....	1925	1,296	166	49	.....	8	1,519	2,702
		1926	2,662	249	76	10	7	3,004	5,537
		1927	1,880	271	78	6	6	2,241	4,207
3	South of Barrie.....	1925	1,090	135	36	1	16	1,278	2,139
		1926	2,059	200	60	7	14	2,340	4,180
		1927	1,607	211	66	6	15	1,905	3,780
4	Crown Hill.....	1925	652	129	20	.....	14	815	1,232
		1926	1,280	132	23	6	7	1,448	2,416
		1927	984	207	32	7	6	1,236	2,385
5	South limits of Orillia.....	1925	1,132	136	57	8	38	1,371	1,802
		1926	1,783	192	62	14	30	2,081	3,183
		1927	1,559	210	61	14	28	1,872	2,772
6	South of Washago at Sparrow Lake Road.....	1925	817	132	32	.....	10	991	1,530
		1926	1,127	164	47	2	7	1,347	1,738
		1927	894	229	45	.....	10	1,178	1,895

TORONTO-SEVERN HIGHWAY

Traffic Census—Fall

Highway No. 11

DAILY AVERAGE

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
0	Lansing Corner.....	1925	2,113	13	561	2	54	2,743	3,281
		1926	2,121	27	309	23	52	2,532	3,203
		1927	3,731	62	778	10	48	4,629	7,155
1	Langstaff Corner.....	1925	1,521	11	260	5	38	1,835	2,155
		1926	1,591	27	414	8	16	2,056	2,776
		1927	3,587	56	374	8	30	4,055	8,283
2	Top of South Holland Landing Hill.....	1925	545	9	56	4	17	631	746
		1926	615	21	63	8	12	719	1,097
		1927	868	39	62	7	7	983	1,991
3	South of Barrie.....	1925	337	3	25	3	24	392	562
		1926	407	10	35	7	11	470	693
		1927	784	20	51	6	14	875	1,806
4	Crown Hill.....	1925	193	.....	11	6	14	224	302
		1926	271	2	15	6	11	305	461
		1927	479	16	26	6	8	535	1,052
5	South limits of Orillia.....	1925	491	7	46	6	32	582	766
		1926	544	7	48	13	34	646	841
		1927	752	25	61	15	34	887	1,424
6	South of Washago at Sparrow Lake Road.....	1925	190	2	12	.....	10	214	307
		1926	268	18	13	.....	5	304	373
		1927	376	17	34	.....	6	433	751

WHITBY-ORILLIA HIGHWAY

Highway No. 12

Traffic Census—Summer

DAILY AVERAGE

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
1	South of Brooklyn.....	1925 1926 1927	604 Under construction 1,078	41 71	48	.....	25	718	1,308
2	Manchester Corner.....	1925 1926 1927	545 813 631	30 41 36	74 30 37	6 1 5	24 32 43	1,253 938 939	2,326 1,289 1,630
3	At Junction of Highway No. 7—traffic north of....	1925 1926 1927	181 314 250	12 13 11	33 5 12	1	28 14 10	729 212 349	1,331 440 521

WHITBY-ORILLIA HIGHWAY

Highway No. 12

Traffic Census—Fall

DAILY AVERAGE

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
1	South of Brooklyn.....	1925 1926 1927	287 Under construction 844	1 11	48	.....	42	378	418
2	Manchester Corner.....	1925 1926 1927	213 321 306	1 1 2	94 25 37	6 1 3	21 31 24	976 271 386	1,981 339 597
3	At junction of Highway No. 7—traffic north of....	1925 1926 1927	103 122 216	..... 1 4	25 8 11	..... 1	18 19 36	351 129 268	750 901 372

PICTON-FOXBORO HIGHWAY

Traffic Census—Summer

Highway No. 14

DAILY AVERAGE

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
1	Bloomfield.....	1925	318	9	18	2	34	381	815
		1926	337	20	28	2	74	461	660
		1927	531	30	62	3	120	746	1,047
2	Rossmore.....	1925	797	49	72	1	50	969	1,264
		1926	507	31	57	1	28	624	1,053
		1927	609	27	93	.....	27	756	1,233
3	Foxboro.....	1925	466	26	31	.....	40	563	803
		1926	452	22	39	1	47	561	880
		1927	514	30	43	2	31	620	953

PICTON-FOXBORO HIGHWAY

Traffic Census—Fall

Highway No. 14

DAILY AVERAGE

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
1	Bloomfield.....	1925	228	1	15	5	61	310	353
		1926	315	4	39	2	77	437	616
		1927	495	4	47	4	88	638	776
2	Rossmore.....	1925	278	1	30	3	38	350	480
		1926	305	7	44	.....	33	389	532
		1927	498	4	98	3	24	627	990
3	Foxboro.....	1925	269	3	28	.....	29	329	461
		1926	283	1	27	2	37	350	552
		1927	437	4	37	2	34	514	760

KINGSTON-OTTAWA HIGHWAY
Traffic Census—Summer
DAILY AVERAGE
Highway No. 15

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
1	Barriefield	1925 1926 1927	573 607 723	102 86 95	46 61 71	1 2 3	65 49 43	787 805 935	972 1,087 1,129
2	Seeley's Bay	1925 1926 1927	288 282 257	69 54 93	15 16 25	3 2 2	26 14 13	401 368 390	614 594 606
3	Lombardy	1925 1926 1927	393 438 427	93 55 59	19 21 31	3 2 2	627 836 119	635 766 681	836 766 852
4	Lot 7, Concession III, Drummond Township	1925 1926 1927	291 255 280	43 23 33	10 11 18	2 2 3	19 29 21	365 320 355	578 483 654
5	Carleton Place, at junction of Smith's Falls Highway	1926 1925 1927	407 Not taken 678	39 44	30 43	2 3	32 59	510 827	761 1,324
6	Bell's Corners	1925 1926 1927	498 646 881	82 35 71	60 38 69	4 3 2	64 28 42	708 750 1,065	1,663 1,221 1,836

KINGSTON-OTTAWA HIGHWAY

Traffic Census—Fall

DAILY AVERAGE

Highway No. 15

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
1	Barriefield.....	1925	314	8	41	4	59	426	670
		1926	369	12	49	.....	52	482	807
		1927	482	18	66	2	43	611	905
2	Seeley's Bay.....	1925	121	3	14	3	18	159	294
		1926	143	9	13	1	22	188	301
		1927	230	13	19	3	22	277	514
3	Lombardy.....	1925	201	6	13	2	93	315	422
		1926	214	4	11	2	90	321	453
		1927	299	10	19	2	85	415	617
4	Lot 7, Concession III, Drummond Township.....	1925	122	3	9	2	28	164	229
		1926	139	3	6	2	21	171	260
		1927	179	4	9	3	23	218	330
5	Carleton Place, junction of Smith's Falls Road....	1926	193	6	24	1	36	260	421
		1927	353	10	33	2	30	428	710
6	Bell's Corners.....	1925	366	6	40	2	47	461	658
		1926	373	8	42	2	41	466	708
		1927	674	22	62	2	35	795	1,728

JOHNSTOWN-OTTAWA HIGHWAY

Highway No. 16

Traffic Census—Summer

DAILY AVERAGE

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
1	Johnstown Corners.....	1925 1926 1927	263 539 478	151 195 247	22 29 36	6 7 5	10 10 10	452 780 776	545 1,326 1,199
2	Concessions I and II, Oxford Township.....	1925 1926 1927	315 495 527	106 131 157	26 34 28	6 11 6	30 25 18	483 696 736	812 1,156 1,349
3	At junction of Ottawa-Kingston Highway.....	1925 1926 1927	1,276 1,254 1,723	145 181 176	82 112 96	17 8 11	60 55 36	1,580 1,610 2,042	1,905 2,171 2,536

JOHNSTOWN-OTTAWA HIGHWAY

Highway No. 16

Traffic Census—Fall

DAILY AVERAGE

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
1	Johnstown Corners.....	1925 1926 1927	111 Not taken 366	47 101 21	17 30 18	..... 4 7	20 14 27	195 515 237	248 857 371
2	Concessions I and II, Oxford Township.....	1925 1926 1927	164 248 381	33 78 37	33 34 48	5 5 12	21 17 61	340 515 601	425 746 857
3	At junction of Ottawa-Kingston Highway.....	1925 1926 1927	443 606 987	59 101	67 123	5 5	43 51	780 1,267	1,007 2,116

PEMBROKE-POINT FORTUNE HIGHWAY

Highway No. 17

Traffic Census—Summer

DAILY AVERAGE

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
1	Cobden Road at Concessions I and II, Ross Twp.	1925	205	7	11	5	84	312	334
		1926	219	7	14	.....	77	317	353
		1927	257	7	15	1	78	358	447
2	Lot 21, Concession I, Admaston Twp.	1925	172	22	12	2	25	233	369
		1926	196	17	12	.....	17	242	374
		1927	229	26	15	1	18	289	439
3	Lots 20, 21, Cons. III, IV, Fitzroy Township	1925	335	21	26	9	30	421	493
		1926	483	27	33	17	26	586	815
		1927	550	33	29	8	14	634	799
4	Lots 15, 16, Concessions III, IV, March Twp.	1925	169	7	11	2	15	204	284
		1926	283	41	45	3	42	414	714
		1927	313	31	15	1	14	374	628
5	Quarries	1925	514	223	74	20	137	968	1,226
		1926	586	243	83	21	83	1,016	1,485
		1927	580	140	135	13	85	953	1,246
6	One mile west of Alfred	1925	200	165	8	17	138	528	802
		1926	299	182	25	10	101	617	901
		1927	212	89	30	4	108	443	643
7	Point Fortune	1925	170	238	14	4	40	465	797
		1926	233	241	27	1	34	536	887
		1927	147	160	22	.....	27	356	568

PEMBROKE-POINT FORTUNE HIGHWAY

Highway No. 17

Traffic Census—Fall

DAILY AVERAGE

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
1	Junction Cobden Road, Concessions II and II, Ross Township, at Beachburg Road. (Assumed as Provincial Highway in 1927.)	1925 1926 1927	98 121 204	1 3 1	6 9 13	..... ..... .....	96 64 104	201 197 322	339 273 393
2	Lot 21, Concession I, Admaston Township.	1925 1926 1927	94 109 223	5 4 16	9 7 17	1 2	17 41 16	126 163 272	156 324 460
3	Lots 20, 21, Concessions III, IV, Fitzroy Township.	1925 1926 1927	184 230 468	5 5 10	23 18 28	..... 2 3	35 41 11	247 296 520	352 495 612
4	Lots 15 and 16, Concessions III, IV, March Twp.	1925 1926 1927	121 199 297	3 20 15	25 33 23	..... 5	20 33 16	169 290 351	176 367 609
5	Quarries.	1925 1926 1927	196 267 577	47 52 135	55 63 125	19 16 12	66 81 74	383 479 923	505 721 1,831
6	One mile west of Alfred	1925 1926 1927	112 151 205	31 46 98	13 18 23	12 6 6	82 93 100	250 314 432	318 418 692
7	Point Fortune.	1925 1926 1927	64 88 152	52 79 132	16 15 22	..... 1	31 33 29	163 216 335	256 297 558

MORPETH TO HIGHWAY No. 7 Via Dresden

Highway No. 21

Traffic Census—Summer

DAILY AVERAGE

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
1	Morpeth.....	1925	320	42	33	.....	28	423	712
		1926	351	49	37	6	44	487	597
		1927	552	48	100	7	29	736	1,062
2	Intersection of Ridgeway-Highgate Road.....	1925	170	19	14	.....	26	229	299
		1926	116	7	9	1	12	145	172
		1927	513	75	38	1	20	647	1,106
3	Dresden-Thamesville Road at Townline Road between Camden and Chatham Townships.....	1927	247	14	22	6	23	312	491
		1925	285	515	23	1	27	851	1,398
		1926	415	26	23	.....	19	483	721
		1927	575	421	33	4	17	1,050	1,758

MORPETH TO HIGHWAY No. 7, Via Dresden

Highway No. 21

Traffic Census—Fall

DAILY AVERAGE

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
1	Morpeth.....	1925	194	3	27	.....	22	246	356
		1926	259	5	25	6	24	319	350
		1927	487	22	47	6	38	600	721
2	Intersection of Ridgeway-Highgate Road.....	1925	33	2	.....	.....	7	42	65
		1926	152	1	13	.....	13	179	217
		1927	398	12	18	3	20	451	851
3	Dresden-Thamesville Road at Townline Road between Camden and Chatham Townships.....	1927	249	9	20	6	38	322	462
		1925	213	79	22	.....	39	353	463
		1926	289	15	12	.....	25	341	558
		1927	295	20	23	.....	42	380	625

LONDON TO HIGHWAY No. 7, Via Strathroy
Traffic Census—Summer
DAILY AVERAGE
Highway No. 22

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
1	Poplar Hill.....	1925	306	588	23	3	19	939	1,225
		1926	294	787	21	3	8	1,113	1,388
		1927	266	306	19	2	7	600	836

LONDON TO HIGHWAY No. 7, Via Strathroy
Traffic Census—Fall
DAILY AVERAGE
Highway No. 22

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
1	Poplar Hill.....	1925	171	80	32	2	13	298	391
		1926	145	106	22	2	8	283	388
		1927	233	98	31	2	7	371	588

MITCHELL-TEVIOTDALE HIGHWAY

Highway No. 23

Traffic Census—Summer

DAILY AVERAGE

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
1	Bornholm.....	1925	230	17	15	.....	47	309	503
		1926	289	12	20	.....	44	365	456
		1927	269	11	25	.....	40	345	484
2	Teviotdale.....	1925	52	1	4	.....	6	63	103
		1926	103	4	7	.....	12	126	173
		1927	221	12	12	.....	21	266	448

MITCHELL-TEVIOTDALE HIGHWAY

Highway No. 23

Traffic Census—Fall

DAILY AVERAGE

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
1	Bornholm.....	1925	202	.....	14	.....	99	315	295
		1926	201	5	15	.....	78	299	325
		1927	314	6	28	1	46	395	610
2	Teviotdale.....	1925	41	.....	5	.....	13	59	65
		1926	69	.....	4	.....	9	82	103
		1927	156	3	11	.....	13	183	306

SIMCOE-GUELPH HIGHWAY, Via Brantford, Paris

Highway No. 24

Traffic Census—Summer

DAILY AVERAGE

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
1	At Concessions 6 and 7, Townsend Township.	1925 1926 1927	304 513 593	9 29 42	46 60 78	1 1	71 56 32	431 659 745	601 887 1,147
2	Oakland.	1927	745	39	89	.....	26	899	1,413
3	Paris.	1927	286	19	29	.....	35	369	464

SIMCOE-GUELPH HIGHWAY, Via Brantford, Paris

Highway No. 24

Traffic Census—Fall

DAILY AVERAGE

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
1	At Concessions VI and VII, Townsend Township.	1925 1926 1927	146 284 425	1 3 15	26 64 96	.....	70 45 40	243 396 576	359 498 799
2	Oakland.	1927	497	8	91	.....	33	629	923
3	Paris.	1927	379	9	36	.....	34	458	831
4	Junction of Road to Ayr.	1927	396	17	29	.....	12	454	901
5	Junction of Road to Preston.	1927	804	8	111	8	12	943	1,643

PALERMO-MILTON HIGHWAY

Highway No. 25

Traffic Census—Summer

DAILY AVERAGE

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
1	Boyne.....	1925	186	1	12	.....	10	209	341
		1926	249	3	14	6	8	280	308
		1927	198	2	21	1	8	230	309

PALERMO-MILTON HIGHWAY

Highway No. 25

Traffic Census—Fall

DAILY AVERAGE

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
1	Boyne.....	1925	198	.....	25	.....	46	269	467
		1926	187	1	22	4	22	236	304
		1927	197	2	17	1	11	228	374

BARRIE-OWEN SOUND HIGHWAY

Highway No. 26

Traffic Census - Summer

DAILY AVERAGE

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
1	Midhurst.....	1925	241	10	15	.....	16	281	483
		1926	398	12	16	.....	12	438	715
		1927	287	19	18	.....	7	331	585
2	Sunnidale Corners.....	1925	233	17	7	.....	15	272	409
		1926	405	24	11	.....	22	462	697
		1927	308	19	12	.....	21	361	385
3	Lot 31, Collingwood Twp.....	1925	301	31	37	.....	13	382	505
		1926	466	16	28	.....	35	545	734
		1927	537	7	55	.....	49	649	747
4	Woodford.....	1925	245	14	9	.....	21	289	408
		1926	288	19	23	.....	24	355	452
		1927	321	21	18	.....	22	382	445

BARRIE-OWEN SOUND HIGHWAY

Highway No. 26

Traffic Census—Fall

DAILY AVERAGE

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse drawn Vehicles	Total daily Average	Maximum for One Day
			Ontario	Foreign					
1	Midhurst.....	1925	101	1	10	.....	17	129	193
		1926	129	1	14	.....	16	160	213
		1927	238	3	12	.....	15	268	430
2	Sunnidale Corners.....	1925	146	1	4	.....	29	180	364
		1926	156	1	18	.....	31	206	265
		1927	181	2	12	.....	20	215	340
3	Lot 31, Collingwood Twp.....	1925	133	.....	22	.....	22	177	214
		1926	368	1	90	.....	71	530	632
		1927	475	2	87	5	80	649	796
4	Woodford.....	1925	154	1	10	.....	27	192	231
		1926	169	.....	15	.....	26	210	255
		1927	299	1	21	1	20	342	504

BARRIE-MIDLAND AND PENETANGUISHENE

Highway No. 27

Traffic Census—Summer

DAILY AVERAGE

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
1	Midhurst.....	1925	170	7	10	.....	6	193	360
		1926	263	7	14	4	1	289	510
		1927	236	9	12	1	1	258	334

BARRIE-MIDLAND AND PENETANGUISHENE

Highway No. 27

Traffic Census—Fall

DAILY AVERAGE

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
1	Midhurst.....	1925	59	.....	7	.....	7	73	111
		1926	54	.....	6	.....	4	64	81
		1927	104	.....	7	.....	2	113	183

PORT HOPE-PETERBOROUGH HIGHWAY

Highway No. 28

Traffic Census—Summer

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
1	Intersection of Welcome Road.....	1926	653	88	48	4	51	844	1,195
		1927	586	121	54	4	30	795	1,499
2	South of Peterborough at Concessions 7 and 8, Monaghan Township.....	1925	467	51	33	.....	19	570	910
		1926	516	63	38	3	18	638	1,073
		1927	492	131	59	4	20	706	1,267

PORT HOPE-PETERBOROUGH HIGHWAY

Highway No. 28

Traffic Census—Fall

DAILY AVERAGE

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
1	Intersection of Welcome Road.....	1925 1926 1927	196 272 232	2 6 3	23 40 68	..... 2 1	53 66 42	274 386 346	339 637 461
2	South of Peterborough at Concessions 7 and 8, Monaghan Township.....	1925 1926 1927	211 266 618	2 10 20	27 37 67	..... 3 3	19 23 7	259 339 715	373 509 1,614

BROCKVILLE-ARNPRIOR HIGHWAY, Via Smith's Falls and Carleton Place

Highway No. 29

Traffic Census—Summer

DAILY AVERAGE

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
1	Forthon.....	1925 1926 1927	59 61 74	8 13 17	30 28 24	1 5	8 4 10	106 106 130	130 152 161
2	Toledo.....	1925 1926 1927	132 191 312	8 9 15	13 15 26	..... ..... 4	72 74 117	225 289 474	328 353 651
3	Lots 2, 3, Concession 9, Ramsay Township.....	1927	327	15	25	.....	31	398	647
4	Lots 20, 21, Concession 9, Ramsay Township.....	1927	296	20	20	1	40	377	605
5	Pakenham.....	1927	129	8	5	.....	40	182	265

BROCKVILLE-ARNPRIOR HIGHWAY, Via Smith's Falls and Carleton Place

Highway No. 29

Traffic Census—Fall

DAILY AVERAGE

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
1	Forthon.....	1925	44	1	24	.....	9	78	112
		1926	42	2	18	.....	4	67	86
		1927	123	3	27	.....	7	164	275
2	Toledo.....	1925	107	1	11	.....	77	196	263
		1926	106	.....	10	.....	73	189	259
		1927	419	15	50	.....	68	561	750
3	Concession 9, Lots 2, 3, Ramsay Township.....	1927	302	7	28	.....	23	360	606
4	Concession 9, Lots 20, 21 Ramsay Township.....	1927	179	3	19	.....	53	254	324
5	Pakenham.....	1927	244	3	18	.....	130	395	471

MORRISBURG NORTH HIGHWAY

Highway No. 31

Traffic Census—Summer

DAILY AVERAGE

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
1	Morrisburg.....	1925	529	71	78	9	152	839	940
		1926	437	71	55	8	72	643	882
		1927	419	65	43	9	75	611	866
2	South of Winchester.....	1925	397	27	32	3	114	573	783
		1926	390	28	33	3	100	554	700
		1927	487	49	45	4	131	716	946

MORRISBURG NORTH HIGHWAY

Highway No. 31

Traffic Census Fall

DAILY AVERAGE

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
			Ontario	Foreign					
1	Morrisburg.....	1925	240	17	43	10	104	414	623
		1926	150	12	14	5	38	219	290
		1927	393	45	38	8	67	551	674
2	South of Winchester.....	1925	241	6	21	3	106	377	409
		1926	261	5	28	2	83	379	476
		1927	566	33	56	4	142	801	1,040

TRAFFIC ON THE BRIDGES IN THE NIAGARA DISTRICT

Fall

Bridge	Direction	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total	Maximum for One Day
			Ontario	Foreign					
Peace Bridge.....	Going into the States.....	1927	1,744	7,916	104	452	11	10,227	
	Coming into Canada.....	1927	1,946	8,994	87	471	3	11,501	
	Total for one week, Oct. 12-18..... Daily Average.....		3,690 527	16,910 2,416	191 27	923 132	14 2	21,728 3,104	6,335
Lower Niagara Falls Bridge...	Going into the States.....	1927	4,649	6,169	401	173	33	11,425	
	Coming into Canada.....	1927	4,044	5,965	278	157	36	10,480	
	Total for one week, Oct. 12-18..... Daily Average.....		8,693 1,242	12,134 1,733	679 97	330 47	69 10	21,905 3,129	4,894
Upper Niagara Falls Bridge...	Going into the States.....	1927	2,361	3,595	84	26	.....	6,066	
	Coming into Canada.....	1927	2,416	3,424	73	25	.....	5,938	
	Total for one week, Oct. 12-18..... Average Daily.....		4,777 682	7,019 1,003	157 23	51 7	.....	12,004 1,715	2,420
Lewiston Bridge.	Going into the States.....	1927	301	704	9	.....	2	1,016	
	Coming into Canada.....	1927	289	668	10	1	2	970	
	Total for one week Oct. 12-18..... Daily Average.....		590 84	1,372 196	19 3	1	4 1	1,986 284	575
	Grand Total for the Four Bridges.....		17,750	37,435	1,046	1,305	87	57,623	
	Total Daily Average Four Bridges.....		2,535	5,348	150	186	13	8,232	14,224

LABOUR DAY, 1926 and 1927
Traffic Census
DAILY AVERAGE

Station No.	Location of Observer	Year	Automobiles		Trucks	Busses	Horse-drawn Vehicles	Total Daily	Maximum for One Day
			Ontario	Foreign					
2-17	Long Branch.....	1926	12,392	6,279	491	298	24	19,484	.....
2 18	Junction of Danforth Avenue and Markham Road..	1927	11,485	10,880	609	371	21	23,366	.....
		1926	9,597	544	201	64	31	10,437	.....
2-18 1/4	Junction of Old Kingston Road and Provincial Highway.....	1927	8,444	897	276	160	14	9,791	.....
		1926	11,352	1,378	256	76	29	13,091	.....
5 1	Dundas Street at Islington.....	1927	11,901	1,896	387	115	32	14,331	.....
		1926	10,603	2,130	370	60	15	11,048	.....
5 2	Dundas Street at Cooksville.....	1927	13,630	2,037	414	43	9	16,133	.....
11 0	Yonge Street at Lansing.....	1927	13,868	3,425	464	49	16	17,822	.....
11 1	Yonge Street at Langstaff.....	1926	8,007	1,230	364	10	42	9,653	.....
2 2	Maidstone.....	1927	8,412	989	211	10	6	9,628	.....
3 1	Maidstone.....	1927	2,486	5,868	134	30	65	8,583	.....
8 1	South end Corner.....	1927	4,755	7,386	229	28	66	12,464	.....
	Welland 1a Garrison Rd. at Ridgeway Road.....	1927	5,757	11,334	97	101	3	17,292	.....
	Welland 1 b Ridgeway Rd. at Garrison Road.....	1927	1,620	13,730	88	57	0	15,495	.....
		1927	1,709	9,646	97	51	10	11,513	.....

Appendix No. 15
COUNTY ROAD TRAFFIC CENSUS—1925, 1926 and 1927
DAILY AVERAGE

Station and Location of Observer	Year	Ontario	Foreign	Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
BRANT COUNTY—SUMMER:								
Brant 1a—Townline Road at Oakland Road.....	1925	45	1	10	.....	23	79	118
	1926	47	2	11	.....	20	80	108
	1927	36	.....	10	.....	18	64	92
Brant 1b—Oakland Road at Townline Road.....	1925	177	5	26	.....	55	263	322
	1926	463	17	47	1	37	736	736
	1927	147	2	20	.....	23	162	256
Brant 2a—Brantford-Galt Road at Shipman's Corners....	1925	201	6	15	9	16	247	384
	1926	236	12	14	8	19	289	356
	1927	257	7	25	9	11	309	380
Brant 2b—Dundas Street at Shipman's Corners.....	1925	43	2	4	.....	12	61	98
	1926	49	2	2	.....	18	71	94
	1927	43	2	8	.....	9	62	84
Brant 3a—Burford Road at New Durham Road.....	1925	450	342	41	.....	12	845	1,152
	1926	313	32	17	.....	17	379	516
	1927	327	24	88	2	13	454	603
Brant 3b—New Durham Road at Burford Road.....	1925	156	33	19	.....	22	230	250
	1926	82	5	2	1	8	98	157
	1927	104	3	24	.....	3	134	172
2-13a—Onondaga Road at Cainsville.....	1925	186	5	27	.....	43	261	324
	1926	373	17	34	2	38	464	559
	1927	282	9	40	2	35	368	492
24-2a—Scotland Road at Oakland.....	1927	449	8	59	.....	21	537	790
BRANT COUNTY—FALL:								
Brant 1a—Townline Road at Cockshutt Road.....	1925	16	.....	2	.....	39	57	81
	1926	6	.....	.....	.....	25	31	45
	1927	45	.....	7	.....	20	72	148
Brant 1b—Cockshutt Road at Townline Road.....	1925	101	1	17	.....	57	176	273
	1926	94	1	11	.....	47	153	270
	1927	129	1	18	.....	25	173	321
Brant 2a—Brantford-Galt Road at Shipman's Corners....	1925	92	2	19	9	20	142	211
	1926	156	1	16	9	20	202	227
	1927	236	1	36	9	21	303	491
Brant 2b—Dundas Street at Shipman's Corners.....	1925	14	.....	4	1	15	34	49

	1926	26	1	6	15	48	94
Brant 3a—Burford Road at New Durham Road.....	1927	44	.....	7	.....	70	94
	1925	210	2	39	.....	277	353
	1926	211	4	58	.....	294	372
Brant 3b—New Durham Road at Burford Road.....	1927	370	31	94	2	512	641
	1925	103	.....	19	.....	130	202
	1926	93	.....	34	.....	10	178
	1927	118	2	20	.....	143	210
2-13a—Onondaga Road at Cainsville.....	1925	164	1	33	.....	260	333
	1926	175	2	34	1	257	423
	1927	239	4	34	1	316	638
24-2a—Scotland Road at Oakland.....	1927	322	2	52	.....	405	544
SIOUX COUNTY—SUMMER:							
Bruce 2a—S. of Southampton, Southampton-Kincardine traffic.....	1925	193	29	11	.....	31	409
	1926	244	43	15	.....	264	420
	1927	332	50	11	1	328	662
Bruce 2b—S. of Southampton, Paisley Road traffic.....	1925	5	1	4	2	401	96
	1926	55	2	3	.....	12	78
	1927	183	11	3	.....	18	112
Bruce 3a—Miller Lake Road traffic at St. Edmonds-Lindsay Townline.....	1925	35	1	.....	.....	7	259
	1926	31	3	.....	.....	43	96
	1927	20	6	1	.....	35	58
Bruce 3b—Brinkman Road traffic at St. Edmonds-Lindsay Townline.....	1925	19	1	.....	.....	1	37
	1926	9	.....	.....	.....	21	26
	1927	5	1	.....	.....	9	20
Bruce 4a—Lucknow Road at Langside Road, Lot 30, Kinloss Twp.....	1925	117	5	14	.....	150	168
	1926	Not taken	.....	.....	.....	.....	.....
	1927	157	5	14	.....	184	266
Bruce 4b—Langside Road at Lucknow Road, Lot 30, Kinloss Twp.....	1925	10	.....	.....	.....	15	20
	1926	Not taken	.....	.....	.....	.....	.....
	1927	26	1	1	.....	33	42
Bruce 5a—Owen Sound-Southampton traffic at junction of Hepworth-Wiarton Road.....	1927	251	69	17	3	346	428
Bruce 5b—Hepworth-Wiarton traffic at junction of Owen Sound-Southampton Road.....	1927	124	31	8	.....	166	253
4a-1a—Chesley Road at Hanover Road.....	1925	103	4	9	.....	140	153
	1926	128	2	8	.....	160	204
	1927	157	2	8	.....	188	388

BRUCE COUNTY—SUMMER:

Bruce 2a—S. of Southampton, Southampton-Kincardine traffic.....

Bruce 2b—S. of Southampton, Paisley Road traffic.....

Bruce 3a—Miller Lake Road traffic at St. Edmonds-Lindsay Townline.....

Bruce 3b—Brinkman Road traffic at St. Edmonds-Lindsay Townline.....

Bruce 4a—Lucknow Road at Langside Road, Lot 30, Kinloss Twp.....

Bruce 4b—Langside Road at Lucknow Road, Lot 30, Kinloss Twp.....

Bruce 5a—Owen Sound-Southampton traffic at junction of Hepworth-Wiarton Road.....

Bruce 5b—Hepworth-Wiarton traffic at junction of Owen Sound-Southampton Road.....

44a-1a—Chesley Road at Hanover Road.....

COUNTY ROAD TRAFFIC CENSUS—1925, 1926 and 1927—Continued

DAILY AVERAGE

Station and Location of Observer	Year	Ontario	Foreign	Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
BRUCE COUNTY—FALL:								
Bruce 2a—Southampton-Kincardine Road at Paisley Road, S. of Southampton.....	1925	84	1	7	.....	31	123	164
	1926	107	2	8	1	23	141	168
	1927	228	3	10	1	16	258	422
Bruce 2b—Paisley Road at Southampton-Kincardine Road, S. of Southampton.....	1925	31	.....	2	.....	24	57	86
	1926	21	.....	1	.....	11	33	40
	1927	79	.....	3	.....	9	91	124
Bruce 3a—Miller Lake Road at St. Edmonds-Lindsay Townline.....	1925	7	.....	.....	.....	4	11	16
	1926	11	.....	2	.....	1	14	26
	1927	14	4	3	.....	0	21	45
Bruce 3b—Brinkman Road at St. Edmonds-Lindsay Townline.....	1925	3	.....	.....	.....	1	4	7
	1926	2	.....	.....	.....	.....	2	4
	1927	4	1	.....	.....	.....	5	18
Bruce 4a—Lucknow Road at Langside Road, Lot 30, Kinloss Twp.....	1925	117	5	14	.....	14	150	168
	1926	Not taken	.....	.....	.....	.....	.....	.....
	1927	135	1	10	.....	9	155	327
Bruce 4b—Langside Road at Lucknow Road, Lot 30, Kinloss Twp.....	1925	10	.....	.....	.....	5	15	20
	1926	Not taken	.....	.....	.....	.....	.....	.....
	1927	43	2	.....	.....	6	53	89
Bruce 5a—Owen Sound-Southampton Road at Hepworth-Wiarton Road.....	1927	244	11	18	3	13	289	390
Bruce 5b—Hepworth-Wiarton Road at Owen Sound-Southampton Road.....	1927	112	5	9	.....	4	130	168
	1927	100	13	10	.....	9	132	186
Bruce 6a—Tiverton-Southampton Road at Pinkerton Road	1927	50	3	4	.....	20	77	93
Bruce 6b—Tiverton-Southampton Road at Pinkerton Rd.	1927	142	47	9	1	6	205	349
Bruce 6b—Tiverton-Pinkerton traffic at Southampton Rd.	1927	53	6	5	.....	17	81	110
9-4a—Kinloss-Lucknow traffic at Kinloss.....	1925	67	3	4	.....	10	84	159

4A 1a—Chesley Road at Hanover Road.....	1926	55	3	1	.....	7	67	110
	1927	74	3	8	.....	8	93	126
	1925	88	.....	5	.....	41	134	205
	1926	128	.....	5	.....	47	180	243
	1927	113	1	8	.....	22	144	246
9-1a—Kinloss-Lucknow Road at Kinloss.....	1925	Closed to traffic	.....	.....	.....	.....	.....	.....
	1926	44	.....	3	.....	7	54	83
	1927	59	1	7	.....	7	74	100
CARLETON COUNTY SUMMER:								
Carleton 1a—Morrisburg-Ottawa Road at Metcalfe Road Lots 20 and 21, Cons. 6 and 7, Osgoode Twp....	1925	254	19	28	6	58	365	422
	1926	408	22	39	3	52	524	898
	1927	287	21	29	4	8	349	593
Carleton 1b—Metcalfe Road at Morrisburg-Ottawa Road Lots 20 and 21, Con. 6, Osgoode Twp.	1925	205	8	22	6	37	278	363
	1926	186	5	21	4	33	249	359
	1927	200	2	24	2	28	256	398
Carleton 2—Morrisburg-Ottawa Road, Lot 3, Con. 3, Gloucester Township.....	1925	600	39	71	4	95	809	915
	1926	576	54	63	10	84	787	1,068
	1927	694	73	124	4	52	947	1,330
Carleton 3a—Stittsville-Carp Road at West Huntley Road	1925	173	7	9	.....	39	228	359
	1926	163	6	11	.....	29	209	321
	1927	161	6	12	.....	33	212	321
Carleton 3b—West Huntley Road at the Stittsville-Carp Road.....	1925	22	.....	.....	.....	7	29	32
	1926	21	.....	1	.....	8	30	45
	1927	20	.....	1	.....	6	27	43
Carleton 4a—Almonte-Carp Road at Stittsville-Carp Road	1925	28	.....	.....	.....	17	45	76
	1926	43	.....	.....	.....	22	66	98
	1927	76	15	13	.....	34	138	183
Carleton 4b—Stittsville-Carp Road at Almonte-Carp Road	1925	189	4	9	.....	58	260	376
	1926	169	4	10	.....	45	228	328
	1927	165	10	18	.....	46	239	335
Carleton 5a—Bovesville Road at Townline Road.....	1925	37	1	14	.....	29	81	98
	1926	51	.....	7	.....	21	79	161
	1927	40	.....	4	.....	22	66	81
Carleton 5b—Townline Road between Nanotick and Metcalfe Twps., at Bovesville Road.....	1925	37	1	14	.....	29	81	98
	1926	51	.....	7	.....	21	79	161
	1927	26	.....	5	.....	36	67	77
Carleton 6a—Townline Road at River Road.....	1925	165	2	13	.....	97	277	373
	1926	63	2	9	.....	34	108	140
	1927	121	1	8	.....	59	189	261

COUNTY ROAD TRAFFIC CENSUS—1925, 1926 and 1927—Continued

DAILY AVERAGE

Station and Location of Observer	Year	Ontario	Foreign	Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
Carleton 6b—River Road at Townline Road.....	1925	115	2	7	.....	68	192	236
	1926	80	1	7	.....	41	129	189
	1927	84	1	6	1	37	129	215
Carleton 7a—River Road at Bowesville Road.....	1925	149	3	10	1	16	179	238
	1926	103	5	26	1	20	155	219
	1927	71	.....	60	.....	7	138	169
Carleton 7b—Bowesville Road at River Road.....	1925	93	3	11	1	21	129	144
	1926	462	28	49	19	43	601	1,137
	1927	534	6	83	.....	27	650	787
Carleton 8a—Franktown Road at Richmond Village.....	1927	129	4	8	.....	29	170	249
Carleton 8b—Richmond Road at Richmond Village.....	1927	260	7	18	.....	47	332	459
15-6a—Richmond Road at Bell's Corners.....	1925	176	6	16	.....	33	232	322
	1926	455	30	46	2	32	565	909
	1927	218	6	21	.....	25	271	448
17-3a—Galletta Road at Lots 20 and 21, Cons. 3 and 4, Fitzroy Twp.....	1925	227	9	17	4	24	282	308
	1926	330	6	19	9	22	386	455
	1927	346	10	17	4	9	386	565
17-3b—Pakenham Road, at Lots 20 and 21, Cons. 3 and 4, Fitzroy Twp.....	1925	115	3	5	2	20	145	227
	1926	145	2	6	4	21	178	214
	1927	227	9	6	2	6	251	376
17-4a—County Road between Lots 15 and 16, Cons. 3 and 4, March Twp.....	1925	205	11	16	1	20	254	461
	1926	206	31	36	4	31	308	564
	1927	245	17	13	.....	12	287	583
CARLETON COUNTY—FALL:								
Carleton 1a—Morrisburg-Ottawa Road at Metcalfe Road, Lots 20 and 21, Cons. 6 and 7, Osgoode Twp ...	1925	192	1	22	2	46	263	394
	1926	257	8	36	6	47	354	439
	1927	435	9	45	4	32	525	958
Carleton 1b—Metcalfe Road at Morrisburg Road, Lots 20 and 21, Cons. 6 and 7, Osgoode Twp.....	1925	109	1	12	2	29	153	211
	1926	147	8	18	5	46	224	310
	1927	214	.....	23	4	25	266	390

Carleton 2—Morisburg-Ottawa Road, Lot 3, Gloucester Township	1925 1926 1927	291 456 568	8 20 37	66 63 112	4 3 2	90 74 45	459 618 764	756 907 1,504
Carleton 3a—Stittsville-Carp Road at West Huntley Road	1925 1926 1927	101 98 157	..... ..... 2	9 6 9	..... 1	35 31 40	145 152 208	204 375 30
Carleton 3b—West Huntley Road at Stittsville-Carp Road	1925 1926 1927	10 10 19	..... ..... .....	1 1 1	..... ..... .....	5 3 4	16 14 32	19 110 67
Carleton 4a—Almonte-Carp Road at Stittsville-Carp Road	1925 1926 1927	18 32 76	..... 3 4	1 3 9	..... ..... .....	40 21 59	59 118 144	110 167 164
Carleton 4b—Stittsville-Carp Road at Almonte-Carp Road	1925 1926 1927	93 91 194	..... 2 5	8 7 18	..... ..... .....	42 41 69	141 286 458	220 141 160
Carleton 5a—Bowesville Road at Townline Road	1925 1926 1927	9 53 32	..... 2	1 5 7	..... ..... .....	10 37 13	20 97 52	32 160 69
Carleton 5b—Townline Road between Nanotick and Metcalfe Road at Bowesville Road	1925 1926 1927	9 53 51	..... 2	1 5 8	..... ..... .....	10 37 17	20 97 76	32 160 131
Carleton 6a—Townline Road at River Road	1925 1926 1927	53 47 141	..... ..... 1	8 4 18	..... ..... .....	53 30 62	114 81 222	192 100 333
Carleton 6b—River Road at Townline Road	1925 1926 1927	54 43 89	..... ..... .....	6 3 9	..... ..... .....	60 28 40	120 74 139	143 90 224
Carleton 7a—River Road at Bowesville Road	1925 1926 1927	36 60 39	..... 1	3 38 53	..... 3	29 11 24	68 113 108	109 138 173
Carleton 7b—Bowesville Road at River Road	1925 1926 1927	71 217 339	..... 5 2	13 55 101	..... ..... .....	1 24 62	93 108 339	101 173 453
Carleton 8a—Franktown Road at Richmond Village	1926 1927	296 88	6 1	31 13	..... .....	36 51	183 384	769 221
Carleton 8b—Richmond Road at Richmond Village	1925 1926 1927	103 195	1 4	13 19	..... .....	17 22 19	119 139 237	573 198 490
15-6a—Richmond Road at Bell's Corners	1926 1927	103 195	1 4	13 19	..... .....	22 19	139 237	198 490
17-3a—Galetta Road at Lots 20 and 21, Cons. 3 and 4, Fitzroy Twp.	1925 1926 1927	90 100 261	2 1 2	10 13 16	..... 1 3	27 25 14	129 140 296	200 195 381

COUNTY ROAD TRAFFIC CENSUS—1925, 1926 and 1927—Continued

DAILY AVERAGE

Station and Location of Observer	Year	Ontario	Foreign	Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
17-3b—Pakenham Road at Lots 20 and 21, Cons. 3 and 4, Fitzroy Twp.....	1925 1926 1927	24 24 155	..... ..... 1	3 4 4	..... ..... .....	14 16 14	41 44 174	62 60 251
17-4a—County Road between Lots 15 and 16, Cons. 3 and 4, March Twp.....	1925 1926 1927	99 110 171	2 11 10	19 24 15	..... ..... .....	24 27 16	144 172 212	193 238 348
DUFFERIN COUNTY—SUMMER:								
Dufferin 1a—Arthur Road at Grand Valley Road.....	1925 1926 1927	30 168 191	..... 3 7	1 13 12	..... ..... .....	5 22 28	36 206 238	47 258 305
Dufferin 1b—Grand Valley Road at Arthur-Orangeville Rd.	1925 1926 1927	131 166 186	2 1 4	5 12 13	..... ..... .....	23 26 24	161 205 227	170 280 265
Dufferin 1c—Bellwood Road at junction Grand Valley Road and Arthur-Orangeville Road.....	1925 1926 1927	18 49 54	..... ..... .....	1 2 7	..... ..... .....	2 9 7	21 60 68	35 88 97
Dufferin 2a—Hillsburg Road at Reading.....	1925 1926 1927	195 113 127	4 1 3	4 4 6	..... ..... .....	6 3 5	209 121 141	353 194 212
Dufferin 2b—Fergus-Orangeville Road at Reading.....	1925 1926 1927	215 174 182	2 4 5	6 8 12	..... ..... .....	6 8 13	229 194 212	287 323 298
10-3a—Hockley's Road, Lots 5 and 6, Con. 2, West Mono Twp.....	1925 1926 1927	103 108 171	1 1 6	15 10 16	..... ..... 1	14 9 16	133 128 210	184 164 331
10-4a—Shelburne-Collingwood Road traffic North of Shelburne.....	1927	232	7	22	.....	46	307	399
DUFFERIN COUNTY—FALL:								
Dufferin 1a—Arthur Road at Grand Valley Road.....	1925 1926	45 108	1	4 8	..... .....	20 39	70 155	91 199

Dufferin 1b—Grand Valley Road at Arthur Road.	1927	122	1	8	17	148	203
	1925	76	1	8	38	124	139
	1926	112		8	50	170	211
Dufferin 1c—Bellwood Road at Grand Valley Road.	1927	89		7	22	118	145
	1925	17		2	10	29	39
	1926	33		3	17	53	78
Dufferin 2a—Hillsburg Road at Reading.	1927	48		5	10	63	98
	1925	70	1	12	24	107	139
	1926	68	1	6	4	79	97
Dufferin 2b Fergus-Orangeville Road at Reading.	1927	102	1	16	4	123	213
	1925	81	1	13	23	118	164
	1926	99	1	7	4	111	138
10-3a—Hockley's Road at Lots 5 and 6, Con. 2, West Mono Twp.	1927	159	1	24	7	191	341
	1925	58		3	22	83	125
	1926	57		7	13	77	92
10-4a—Shelburne-Collingwood Road North of Shelburne.	1927	80		10	6	96	175
	Under construction.						
DUNDAS COUNTY—SUMMER:							
Dundas 2a—Crysler Road at Morewood.	1925	153	1	8	122	284	422
	1926	176	2	10	148	336	457
	1927	197	3	17	137	354	547
Dundas 2b—Chesterville Road at Morewood.	1925	192	2	8	171	373	504
	1926	213	2	14	169	399	507
	1927	216	4	19	139	378	507
Dundas 3a—Williamsburg-Chesterville Road at junction of Road to Gallington.	1925	1	7	9	56	73	221
	1926	126	7	8	50	191	262
	1927	145	6	8	34	194	222
Dundas 3b—Road to Gallington at junction of Williamsburg-Chesterville Road.	1925	18	1	4	69	92	143
	1926	26	1	3	71	101	154
	1927	25		2	21	48	81
31-2a—Chesterville Road, 1½ miles South of Winchester.	1925	139	6	12	26	183	283
	1926	136	6	14	18	174	261
	1927	181	6	15	25	227	305
DUNDAS COUNTY—FALL:							
Dundas 2a Crysler Road at Morewood.	1925	85		3	99	187	231
	1926	207	2	14	205	428	562
	1927	218	6	19	161	404	550
Dundas 2b Chesterville Road at Morewood.	1925	120		8	155	283	360
	1926	220	1	14	192	427	607
	1927	218	6	19	138	381	546

COUNTY ROAD TRAFFIC CENSUS—1925, 1926 and 1927—Continued

DAILY AVERAGE

Station and Location of Observer	Year	Ontario	Foreign	Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
Dundas 3a—Williamsburg-Chesterville Road at Bouckhill Road.....	1925 1926 1927	85 94 129	3 3 5	7 11 8	..... ..... 1	52 48 28	147 156 171	217 173 220
Dundas 3b—Gallingtown Road at Bouckhill Road.....	1925 1926 1927	18 23 28	..... 1	2 1 1	..... 1	53 47 32	73 72 62	108 99 83
31-2a—Chesterville Road, 1½ miles South of Winchester.	1925 1926 1927	107 110 258	1 2 17	7 10 25	..... ..... 1	32 22 82	147 144 383	190 183 404
ELGIN COUNTY—SUMMER:								
Elgin 1a—Port Bruce Road at Copenhagen.....	1925 1926 1927	113 105 172	4 9 8	1 13 16	..... ..... 1	22 10 5	140 137 202	217 200 382
Elgin 1b—Port Burwell Road at Copenhagen.....	1925 1926 1927	209 204 268	10 18 21	11 14 18	1	18 18 14	249 254 321	478 359 655
Elgin 2a—St. Thomas-Port Stanley Road at Union.....	1925 1926 1927	1,400 1,771 1,779	156 199 214	104 120 132	1	21 22 18	1,682 2,112 2,143	2,653 2,945 3,912
Elgin 2b—Sparta Road at Union.....	1925 1926 1927	390 328 336	22 17 38	51 46 57	..... ..... .....	22 19 16	485 410 447	594 536 603
Elgin 3a—Dutton-West Lorne Road at Lots 6 and 7, Dunwich Township.....	1925 1926 1927	124 121 194	6 6 6	15 7 23	..... ..... .....	15 8 11	157 142 234	187 179 262
Elgin 3b—Campbellton Road at Lots 6 and 7, Dunwich Township.....	1925 1926 1927	22 15 14	..... 1 1	2 2	..... ..... .....	5 6 9	21 22 26	44 33 33
Elgin 4a—Campbellton Road at Dunwich Townline.....	1925 1926 1927	17 11 9	1	1 1 1	..... ..... .....	1 1 3	20 13 13	35 19 26

Elgin 4b—Aldboro-Dunwich Townline at Campbellton Rd.	1925 1926 1927	37 27 16	2 1 1	1	.....	.....	.....	7 8	18 36	30 58
Elgin 5a—Sheddon-Port Stanley Road at Fingal.	1925 1926 1927	288 218 307	25 9 27	12 17 18	1	.....	.....	21 19 23	26 345 375	44 343 471
Elgin 5b Talbot Road at Fingal.	1925 1926 1927	297 353 38	16 1	20 26 2	.....	.....	.....	21 17 8	355 413 412	468 413 594
Elgin 6—Glencoe Road at Walker's Bridge.	1925 1926 1927	27 25 210	1 9	2 1 8	.....	.....	.....	2 13 12	49 42 38	67 55 56
3-5a—Dutton-Tyrconnell Road at Wallacetown.	1925 1926 1927	189 199 117	4 8 6	9 10 11	.....	.....	.....	12 8 11	239 210 229	738 315 423
3-7a—Belmont Road at New Sarum	1925 1926 1927	137 132	5 5	10 9	.....	.....	.....	8 16	142 160 162	240 175 284
3-8a—Bayham Road at Provincial Highway No. 3, Lot 107, Malahide Township.	1925 1926 1927	93 85 104	12 13 13	15 11 14	.....	.....	.....	15 7 9	135 116 141	191 153 235
ELGIN COUNTY—FALL:										
Elgin 1a—Port Bruce Road at Copenhagen.	1925 1926 1927	54 68 68	2 1 2	5 15 9	.....	.....	.....	12 11 7	73 95 86	87 124 140
Elgin 1b Port Burwell Road at Copenhagen.	1925 1926 1927	52 59 96	..... ..... 3	4 9 14	.....	.....	.....	17 12 12	73 81 125	116 105 259
Elgin 2a—St. Thomas-Port Stanley Road at Union.	1925 1926 1927	390 452 576	2 7 14	61 74 85	.....	.....	.....	24 20 20	477 553 695	611 647 1,223
Elgin 2b—Sparta Road at Union.	1925 1926 1927	197 202 253	1 2 4	37 36 43	.....	.....	.....	18 22 22	331 262 322	331 308 480
Elgin 3a—Dutton-West Lorne Road at Lots 6 and 7, Dunwich Township.	1925 1926 1927	71 134 135	1 1 2	13 13 12	.....	.....	.....	7 10 5	92 184 154	145 203
Elgin 3b—Campbellton Road at Lots 6 and 7, Dunwich Township.	1925 1926 1927	14 11 18	..... ..... 1	2 1 1	.....	.....	.....	5 5 3	21 17 23	44 23 35

COUNTY ROAD TRAFFIC CENSUS—1925, 1926 and 1927—Continued

DAILY AVERAGE

Station and Location of Observer	Year	Ontario	Foreign	Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
Elgin 4a—Campbellton Road at Dunwich Townline.....	1925 1926 1927	6 7 15	..... ..... .....	1 1	..... ..... .....	3 3 4	10 10 20	18 15 32
Elgin 4b—Aldborough-Dunwich Townline at Campbellton Road.....	1925 1926 1927	8 10 32	..... ..... .....	1 1 1	..... ..... .....	9 4 9	18 15 42	30 18 58
Elgin 5a—Shedden-Port Stanley Road at Fingal.....	1925 1926 1927	Not taken 314 185	..... 6 2	..... 42 14	..... ..... .....	65 16	427 217	494 398
Elgin 5b—Talbot Road at Fingal.....	1925 1926 1927	Not taken 529 321	..... 9 2	..... 54 25	..... ..... .....	71 35	663 383	785 424
Elgin 6—Glencoe Road at Walker's Bridge.....	1925 1926 1927	20 13 29	..... ..... .....	3 5 3	..... 1	4 6	23 38	29 55
3-5a—Dutton-Tyrconnell Road at Wallacetown.....	1925 1926 1927	82 126 135	1 5 2	10 10 9	..... ..... 1	21 19 15	114 160 162	162 186 222
3-7a—Belmont Road at New Sarum.....	1925 1926 1927	67 92 625	1 2 17	8 6 37	..... ..... 7	8 7 10	84 107 696	122 128 1,069
3-8a—Bayham Road at Provincial Highway No. 3, Lot 107, Malahide Township.....	1925 1926 1927	49 77 105	2 1 3	7 16 15	..... ..... .....	11 11 13	69 105 136	88 150 267
ESSEX COUNTY—SUMMER:								
Essex 1a—Tecumseh Road at Stoney Point.....	1925 1926 1927	390 344 480	67 29 74	24 33 25	..... ..... .....	63 43 38	454 449 617	998 767 1,326
Essex 1b—Comber Road at Stoney Point.....	1925 1926 1927	192 214 235	33 18 21	6 18 12	..... ..... .....	39 31 21	270 281 289	336 548 617
Essex 2a—Cottam Road at junction of 9th Con. Road and Leamington-Staples Road.....	1925 1926 1927	80 113 129	5 10 15	14 17 13	..... ..... .....	11 5 3	110 145 160	245 219 228

	1925	1926	1927	39	4	7				12	7	62	93
Essex 2b—Ninth Concession Road, easterly at Leamington-Staples Road.....		54	5	102	22	13	1			10	83	135	184
Essex 2c—Leamington-Staples Road at junction of Cottam Road and 9th Con. Road.....	1925	212	10	212	10	35				62	319	549	
	1926	276	7	276	7	35				18	336	556	
	1927	391	46	391	46	32				19	488	867	
Essex 3a—Townline between Colchester North and Malden Townships, at junction of Pike Road.....	1925	235	91	235	91	24	4			39	393	877	
	1926	208	100	208	100	35	5			22	370	493	
	1927	348	155	348	155	48	5			17	573	1,328	
Essex 3b—Pike Road at junction of Townline between Colchester North and Malden Townships.....	1925	97	30	97	30	11				38	175	377	
	1926	136	49	136	49	25	1			17	228	331	
	1927	168	39	168	39	19				16	243	545	
Essex 4a—Tecumseh Road at junction of Pilette Road....	1926	1,821	202	1,821	202	322	27			52	2,424	3,030	
	1927	2,188	262	2,188	262	338	41			38	2,867	4,067	
Essex 4b Pilette Road Southerly from Tecumseh Road...	1926	524	39	524	39	111	24			17	716	955	
	1927	238	6	238	6	36				17	298	381	
Essex 5a—River Road at Townline between Anderdon and Sandwich West Townships.....	1926	626	256	626	256	68				9	959	1,722	
	1927	656	298	656	298	71	42			52	1,119	2,322	
Essex 5b—Townline between Anderdon and Sandwich West Townships, at junction of River Road.....	1926	204	12	204	12	34				19	269	367	
	1927	278	55	278	55	44	17			17	411	839	
Essex 6a—Staples-Leamington Road at Staples.....	1926	156	6	156	6	18	4			13	197	339	
	1927	270	48	270	48	24	2			8	352	723	
Essex 6b—Townline Road between Tilbury West and Mersea Townships, at Staples.....	1926	99	3	99	3	8	2			15	127	173	
	1927	163	9	163	9	14	3			16	205	341	
Essex 7a—Anderdon-Malden Townline at junction of Anderdon-Colchester Townline.....	1927	43	3	43	3	5				3	54	104	
Essex 7b—Anderdon-Colchester Townline at junction of Anderdon-Malden Townline.....	1927	366	144	366	144	51	5			18	584	1,312	
2-1a—Howard Avenue at Provincial Highway No. 2.....	1925	851	465	851	465	143	16			14	1,489	3,270	
	1926	1,970	275	1,970	275	519	149			48	2,961	3,958	
	1927	1,483	724	1,483	724	228	23			15	2,473	3,409	
2-3a Belle River-Cottam Road at Woodslee.....	1925	254	22	254	22	124				26	426	610	
	1926	221	16	221	16	40				37	314	394	
	1927	315	38	315	38	48				31	432	586	
3-2a—Division Road at junction of Highway No. 3, North of Cottam.....	1925	Under construction.		Under construction.		40	8			5	725	1,084	
	1926	441	241	441	241	54				3	1,012	2,327	
	1927	641	311	641	311								

COUNTY ROAD TRAFFIC CENSUS—1925, 1926 and 1927—Continued

DAILY AVERAGE

Station and Location of Observer	Year	Ontario	Foreign	Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
ESSEX COUNTY—FALL:								
Essex 1a—Tecumseh Road at Stoney Point.	1925	134	.....	8	.....	43	185	253
	1926	179	.....	7	.....	41	227	316
	1927	388	40	32	.....	59	519	862
Essex 1b—Comber Road at Stoney Point.	1925	110	.....	5	.....	31	146	213
	1926	126	.....	6	.....	27	159	223
	1927	223	10	19	.....	36	288	552
Essex 2a—Cottam Road at junction of 9th Concession Road and Leamington-Staples Road.	1925	160	19	35	1	9	224	402
	1926	82	1	11	.....	4	98	140
	1927	88	2	8	.....	4	102	174
Essex 2b—Ninth Concession Road, Easterly at Leamington-Staples Road.	1925	54	5	13	1	10	83	133
	1926	34	1	5	.....	9	49	86
	1927	69	2	7	.....	15	93	137
Essex 2c—Leamington-Staples Road at junction of Cottam Road and 9th Concession Road.	1925	238	19	28	1	23	309	559
	1926	216	2	28	.....	25	271	385
	1927	266	4	42	.....	46	358	460
Essex 3a—Townline between Colchester North and Malden Townships, at junction of Pike Road.	1925	102	3	17	5	13	140	205
	1926	133	26	22	4	37	222	313
	1927	245	41	42	5	13	346	762
Essex 3b—Pike Road at junction of Townline Road between Colchester North and Malden Townships.	1925	68	4	12	.....	14	98	141
	1926	100	26	13	1	21	161	308
	1927	150	12	15	1	12	190	314
Essex 4a—Tecumseh Road at junction of Pilette Road.	1926	1,589	84	360	52	49	2,134	2,794
	1927	1,771	156	414	42	29	2,412	3,472
Essex 4b—Pilette Road Southerly from Tecumseh Road.	1926	141	1	31	.....	16	189	243
	1927	203	4	48	.....	15	270	330
Essex 5a—River Road at Townline between Anderdon and Sandwich West Townships.	1926	463	73	59	.....	9	604	1,323
	1927	557	144	84	.....	9	794	1,967

COUNTY ROAD TRAFFIC CENSUS—1925, 1926 and 1927—Continued

DAILY AVERAGE

Station and Location of Observer	Year	Ontario	Foreign	Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
FRONTENAC COUNTY—FALL								
Frontenac 1a—Kingston Mills Road at Tuttle's Hill.....	1925	64	1	7	2	9	83	122
	1926	67	3	5	2	10	87	124
	1927	124	2	7	2	7	142	381
Frontenac 1b—Storrington Road at Tuttle's Hill.....	1925	113	1	49	2	22	187	261
	1926	132	1	17	2	26	178	286
	1927	181	2	65	1	19	268	409
Frontenac 2a—Harrowsmith-Yarker Road at Shibley's....	1925	84	2	9	.....	19	114	173
	1926	93	1	12	2	18	126	153
	1927	71	1	9	.....	6	87	140
Frontenac 2b—Portland Road at Shibley's.....	1925	57	1	4	.....	7	69	119
	1926	65	1	6	1	5	78	108
	1927	86	1	12	.....	7	106	151
Frontenac 3a—Bath Road at road leading to Westbrook...	1925	119	4	14	2	13	152	206
	1926	139	3	15	2	10	169	224
	1927	317	14	34	9	17	391	607
Frontenac 3b—Road leading to Westbrook at Bath Road..	1925	73	2	12	.....	12	99	133
	1926	198	6	30	1	6	241	343
	1927	221	11	23	4	14	273	367
2-28a—Portland Road at Cataragui Corner.....	1925	221	1	14	2	43	281	432
	1926	190	1	28	3	40	262	416
	1927	351	6	48	5	42	452	671
GLENGARRY COUNTY—SUMMER								
Glengarry 1a—Vankleek Hill Road at McCrimmon.....	1927	84	12	8	.....	58	162	181
Glengarry 1b—Road West from McCrimmon.....	1927	21	1	.....	.....	49	71	109
Glengarry 1c—Road North and South from McCrimmon..	1927	85	12	9	.....	70	176	199
2-35a—Alexandria Road at Lancaster.....	1925	247	97	51	.....	105	500	627
	1926	286	119	37	3	105	550	641
	1927	215	86	30	2	41	374	462
GLENGARRY COUNTY—FALL								
Glengarry 1a—Vankleek Hill Road at McCrimmon.....	1927	98	12	12	.....	59	181	267
Glengarry 1b—Road West from McCrimmon.....	1927	27	.....	1	.....	51	79	109
Glengarry 1c—Road North and South from McCrimmon..	1927	102	13	12	.....	58	185	230
2-35a—Alexandria Road at Lancaster.....	1925	167	27	25	.....	96	315	451
	1926	131	18	19	2	71	241	310
	1927	175	34	29	1	41	280	350

GREY COUNTY—SUMMER		1927	96	.....	7	.....	23	126	174
Grey 1a	Seventh Concession Road at junction of Rocklyn-Goring Road.....	1927	96	.....	4	.....	13	83	106
Grey 1b	Rocklyn-Goring Road at 7th Concession Road.....	1927	66	.....	4	.....	14	102	118
Grey 2a	Ninth Concession Road at Oxmead.....	1927	82	1	5	.....	20	91	126
Grey 2b	Fifteenth Sideroad, St. Vincent Twp. at Oxmead.....	1927	65	1	5	.....	93	716	879
10-5a	Durham-Singhampton Road at Flesherton.....	1925	566	15	32	10	73	844	965
		1926	689	14	56	12			
		1927	Under construction.						
GREY COUNTY—FALL									
Grey 1a	Seventh Concession Road at Rocklyn-Goring Rd.....	1927	138	.....	10	.....	35	183	583
Grey 1b	Rocklyn-Goring Road at 7th Concession Road.....	1927	73	.....	7	.....	35	115	421
10-5a	Durham-Singhampton Road at Flesherton.....	1925	247	.....	25	9	92	373	401
		1926	Under construction.						
		1927	Under construction.						
HALDIMAND COUNTY—SUMMER									
Haldimand 1a	Indian Line at junction of Road to Springvale.....	1927	111	6	15	.....	32	164	250
Haldimand 1b	Road to Springvale at junction of Indian Line.....	1927	103	5	14	.....	16	138	206
Haldimand 2a	Cheapside Road at Selkirk-Nanticoke Road.....	1925	115	4	11	.....	20	150	175
		1926	297	8	19	1	14	339	525
		1927	263	18	9	.....	19	309	765
Haldimand 2b	Selkirk-Nanticoke Road at junction of Cheapside Road.....	1925	115	4	11	.....	20	150	175
		1926	142	5	15	.....	18	180	237
		1927	93	5	8	.....	18	124	211
3 12a	Hagersville-Bainham Road at Nelles Corners.....	1925	239	15	28	.....	17	229	460
		1926	229	19	49	1	12	310	389
		1927	268	18	31	.....	10	327	461
3 13a	Canboro Road at Canboro Corners.....	1925	144	17	21	.....	26	208	222
		1926	142	10	15	.....	16	183	267
		1927	127	9	9	.....	9	154	240
HALDIMAND COUNTY—FALL									
Haldimand 1a	Indian Line at junction of Road to Springvale.....	1927	126	2	18	.....	32	178	221
Haldimand 1b	Road to Springvale at junction of Indian Line.....	1927	98	2	15	.....	9	124	139
Haldimand 2a	Cheapside Road at Selkirk-Nanticoke Road.....	1925	24	.....	2	.....	27	53	83
		1926	64	1	6	.....	27	98	130
		1927	114	1	7	.....	14	136	230
		1925	24	.....	2	.....	27	53	83
		1926	27	.....	4	.....	34	65	94
		1927	74	1	7	.....	17	99	169
3 12a	Hagersville-Bainham Road at Nelles Corners.....	1925	204	2	29	.....	21	256	301
		1926	204	2	41	.....	23	270	342
		1927	268	8	80	.....	22	378	405

COUNTY ROAD TRAFFIC CENSUS—1925, 1926 and 1927—Continued

DAILY AVERAGE

Station and Location of Observer	Year	Ontario	Foreign	Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
3-13a—Canboro Road at Canboro Corners.....	1925	68	1	10	.....	33	112	202
	1926	50	3	6	.....	25	84	125
	1927	170	11	17	.....	32	230	356
HALTON COUNTY—SUMMER:								
Halton 1a—Middle Road at Merton.....	1925	91	1	27	.....	7	126	168
	1926	104	.....	33	.....	4	141	182
	1927	103	4	18	.....	6	131	186
Halton 1b—Bronte Sideroad at Merton.....	1925	301	10	44	.....	10	365	619
	1926	369	14	45	.....	10	438	725
	1927	356	25	39	.....	8	428	792
2-15a—Guelph Line Road at Toronto-Hamilton Highway	1925	171	6	50	.....	7	234	269
	1926	212	4	46	.....	4	266	356
	1927	198	7	40	.....	1	246	356
5-3a—County Road at Trafalgar, North and South.....	1925	445	14	60	.....	15	534	898
	1926	484	13	52	1	12	562	811
	1927	552	10	73	.....	6	642	1,132
5-4a—Brant Street at junction of Dundas and Brant Streets	1925	264	21	19	.....	8	312	507
	1926	269	19	34	.....	6	328	542
	1927	270	36	24	.....	5	335	577
25-1a—Boyne-Drumquin Road at Boyne.....	1925	82	.....	5	.....	4	91	130
	1926	137	2	6	.....	5	150	193
	1927	109	.....	9	.....	7	125	174
HALTON COUNTY—FALL:								
Halton 1a—Middle Road at Merton.....	1925	61	.....	24	.....	7	92	128
	1926	104	.....	33	.....	4	141	182
	1927	106	.....	19	.....	18	143	269
Halton 1b—Bronte Sideroad at Merton.....	1925	155	1	39	.....	14	209	258
	1926	181	3	43	.....	15	242	387
	1927	302	9	41	.....	18	370	850
2-15a—Guelph Line Road at Toronto-Hamilton Highway	1925	155	.....	50	.....	6	211	271
	1926	159	1	66	.....	10	236	288
	1927	231	1	63	1	3	299	347
5-3a—County Road at Trafalgar, North and South.....	1925	314	1	38	.....	13	366	523
	1926	366	3	70	.....	19	458	616

5-4a—Brant Street at junction of Dundas Street.....	1927	493	3	79	.....	.....	6	581	1,206
	1925	112	2	24	.....	.....	10	148	182
	1926	124	3	19	.....	.....	17	163	253
25-1a—Boyne-Drumquin Road at Boyne.....	1927	200	10	26	.....	.....	4	240	459
	1925	115	.....	115	.....	.....	41	170	235
	1926	108	.....	10	.....	.....	18	136	157
	1927	114	1	8	.....	.....	6	129	204
HASTINGS COUNTY—SUMMER									
Hastings 1a—Hastings Road at Foxboro.....	1925	249	14	17	.....	.....	22	302	416
	1926	214	10	21	.....	1	20	266	486
	1927	242	17	23	.....	.....	16	298	482
Hastings 1b—Stirling Road at Foxboro.....	1925	217	22	14	.....	.....	18	261	387
	1926	238	12	18	.....	.....	27	295	394
	1927	272	13	20	.....	2	15	322	471
Hastings 2—Maynooth Road at Bannockburn.....	1925	103	4	22	.....	.....	20	149	197
	1926	148	11	12	.....	1	22	194	243
	1927	137	11	19	.....	.....	13	180	225
Hastings 3a—Frankford-Foxboro Road at junction of County Road No. 5.....	1925	106	12	10	.....	.....	25	153	178
	1926	62	1	3	.....	1	21	88	131
	1927	66	.....	3	.....	1	14	84	111
Hastings 3b—County Road No. 5 at junction of Frankford- Foxboro Road.....	1925	Not taken.	.....	.....	.....	.....	.....	.....	.....
	1926	57	1	2	.....	1	12	73	123
	1927	52	.....	2	.....	2	11	67	97
Hastings 4a—Frankford-Trenton Road at Frankford.....	1927	527	18	88	.....	4	86	723	815
Hastings 4b—Frankford-Wallbridge Road at Frankford.....	1927	410	15	75	.....	2	71	573	683
Hastings 5a—County Road No. 3, at Marmora.....	1927	391	9	13	.....	2	18	433	480
Hastings 5b—County Road No. 10, at Marmora.....	1927	293	8	24	.....	4	26	355	400
Hastings 6a—County Road No. 1, at Crookston Corners.....	1927	362	18	22	.....	.....	44	679	679
Hastings 6b—County Road No. 9, at Crookston Corners.....	1927	99	2	4	.....	.....	27	132	167
HASTINGS COUNTY—FALL									
Hastings 1a—Hastings Road at Foxboro.....	1925	143	1	14	.....	.....	15	173	248
	1926	139	.....	13	.....	.....	18	170	267
	1927	215	2	21	.....	.....	16	254	410
Hastings 1b—Stirling Road at Foxboro.....	1925	126	2	14	.....	.....	14	156	213
	1926	144	1	13	.....	2	19	179	245
	1927	222	2	16	.....	2	18	260	350
Hastings 2—Maynooth Road at Bannockburn.....	1925	51	.....	14	.....	.....	15	80	105
	1927	75	.....	9	.....	.....	18	102	142
	1927	119	1	22	.....	.....	11	153	203

COUNTY ROAD TRAFFIC CENSUS—1925, 1926 and 1927—Continued

DAILY AVERAGE

Station and Location of Observer	Year	Ontario	Foreign	Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
Hastings 3a—Frankford-Foxboro Road at junction of County Road No. 5.....	1925 1926 1927	36 39 56	..... ..... .....	9 1 2	..... ..... 2	23 18 17	68 58 77	98 82 128
Hastings 3b—County Road No. 5, at junction of Frankford-Foxboro Road.....	1925 1926 1927	39 27 49	1	5 2 5	2 1 2	16 12 13	63 42 69	93 77 112
Hastings 42—Frankford-Trenton Road at Frankford.....	1927	393	4	79	4	117	597	752
Hastings 4b—Frankford-Wallbridge Road at Frankford.....	1927	319	2	59	3	108	491	570
Hastings 5a—County Road No. 3, at Marmora.....	1927	691	8	55	8	105	867	988
Hastings 5b—County Road No. 10, at Marmora.....	1927	634	14	60	7	102	817	1,145
Hastings 6a—County Road No. 1, at Crookston Corners.....	1927	307	1	17	5	38	368	512
Hastings 6b—County Road No. 9, at Crookston Corners.....	1927	99	.....	5	3	21	128	201
HURON COUNTY—SUMMER:								
Huron 2a—Goderich Road at Amberley.....	1925 1926 1927	218 248 273	35 68 71	9 12 13	..... 1	18 31 12	280 360 369	434 496 457
Huron 2b—Lucknow Road at Amberley.....	1925 1926 1927	167 189 223	26 49 43	8 9 9	..... ..... .....	16 25 13	217 272 288	292 350 320
Huron 3a—Wingham-Listowel Road at Brussels-Wroxeter Road.....	1925 1926 1927	101 169 119	2 9 2	5 12 5	..... 1	9 18 7	117 209 133	259 256 291
Huron 3b—Brussels-Wroxeter Road at Wingham-Listowel Road.....	1925 1926 1927	98 196 98	4 12 1	6 16 5	..... 1	12 23 6	120 248 110	206 335 159
Huron 4a—Wincheslea-Berryland Road at Kirkton.....	1925 1926 1927	161 142 181	2 2 7	18 24 33	1 2	49 52 47	231 222 268	279 254 366

Huron 4b—Russeldale-Elginfield Road at Kirkton.....	1925	263	11	18	3	71	366	519
	1926	242	7	30	2	65	346	441
Huron 5a—Hensall Road at Zurich.....	1927	258	14	41	.....	55	368	417
	1925	Under construction.	.....	.....	.....	.....	.....	.....
	1926	509	9	34	2	99	653	786
Huron 5b—Zurich-Bayfield Road at Zurich.....	1927	536	11	38	3	59	647	729
	1925	Under construction.	.....	.....	.....	.....	.....	.....
	1926	416	8	21	1	64	509	563
Huron 6—Bluewater Highway near Brewster.....	1927	344	6	23	2	38	413	443
	1926	466	135	23	4	16	644	1,336
Huron 6a—County Road No. 7 at junction of Bluewater Highway.....	1927	397	153	32	2	12	596	1,423
	1926	244	32	16	2	5	229	648
	1927	240	51	22	3	9	325	761
4 5a Bayfield-Seaforth Road at Brucefield.....	1925	227	12	16	.....	33	288	495
	1926	428	17	33	.....	37	515	792
	1927	385	28	29	1	40	481	731
8-10a—Lucknow Road South of Goderich at Con. A, Lot 9, Goderich Township.....	1925	69	6	4	.....	11	90	164
	1926	Not taken.	.....	.....	.....	.....	.....	.....
	1927	58	11	1	.....	14	84	202
Huron County—Fall:								
Huron 2a—Goderich Road at Amberley.....	1925	91	1	7	.....	26	125	151
	1926	139	11	7	.....	27	184	228
	1927	234	14	17	.....	21	286	353
Huron 2b—Lucknow Road at Amberley.....	1925	72	1	6	.....	18	97	119
	1926	116	10	8	.....	25	159	188
	1927	165	8	15	.....	20	208	255
Huron 3a—Wingham-Listowel Road at Brussels-Wroxeter Road.....	1925	40	.....	2	.....	13	55	75
	1926	75	1	4	.....	11	91	149
	1927	91	.....	7	.....	5	103	175
Huron 3b—Brussels-Wroxeter Road at Wingham-Listowel Road.....	1925	50	.....	3	.....	13	66	101
	1926	96	1	5	.....	13	115	178
	1927	109	.....	7	.....	6	122	212
Huron 4a—Wincheslea-Berryland Road at Kirkton.....	1925	98	.....	18	4	74	194	324
	1926	150	.....	25	2	70	247	325
	1927	179	1	38	4	51	273	302
Huron 4b—Russeldale-Elginfield Road at Kirkton.....	1925	156	.....	10	6	79	260	432
	1926	211	.....	27	2	75	315	408
	1927	246	5	42	7	49	349	416
Huron 5a—Hensall Road at Zurich.....	1925	138	1	24	3	76	242	337
	1926	430	5	50	3	124	612	741
	1927	462	5	45	3	70	585	772

COUNTY ROAD TRAFFIC CENSUS—1925, 1926 and 1927—Continued
DAILY AVERAGE

Station and Location of Observer	Year	Ontario	Foreign	Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
Huron 5b—Zurich-Bayfield Road at Zurich.....	1925	196	1	15	3	80	295	410
	1926	360	5	25	3	73	466	578
	1927	355	4	27	3	49	438	641
Huron 6—Bluestwater Highway near Brewster.....	1926	103	17	12	2	14	148	217
	1927	163	38	18	1	13	150	197
Huron 6a—County Road No. 7 at junction of Bluestwater Highway.....	1926	61	6	10	3	12	92	114
	1927	98	24	14	1	13	150	197
4-5a—Bayfield-Seaforth Road at Brucefield.....	1925	134	.....	11	.....	39	184	256
	1926	176	4	28	.....	47	255	280
	1927	269	5	29	.....	43	346	427
8-10a—Lucknow Road South of Goderich at Con. A, Lot 9, Goderich Township.....	1926	32	.....	3	.....	18	53	72
	1927	140	9	.....	.....	26	175	543
KENT COUNTY—SUMMER:								
Kent 1a—Chatham-Wallaceburg Road at Cons. X and XI, Chatham Township.....	1925	120	10	13	.....	21	164	217
	1926	243	23	31	8	11	316	408
	1927	389	37	58	14	24	522	886
Kent 1b—Mitchell Bay Road at junction of Chatham-Wallaceburg Road.....	1925	37	2	3	.....	24	66	73
	1926	14	.....	1	.....	2	17	24
	1927	92	1	18	.....	19	130	193
Kent 2a—Kent Bridge-Harwich Road at junction of Northwood-Chatham Road.....	1925	231	41	20	4	60	356	741
	1926	167	11	16	.....	25	219	282
	1927	154	4	7	.....	13	178	258
Kent 2b—Northwood-Chatham Road at junction of Kent Bridge Road.....	1925	291	56	21	4	27	399	537
	1926	86	7	11	.....	18	122	183
	1927	78	.....	3	.....	7	88	121
Kent 3a—Port Lambton Road at junction of Wallaceburg-Walpole Island Road.....	1925	210	52	19	.....	14	295	423
	1926	102	23	11	4	5	145	238
	1927	181	33	14	.....	8	236	565

Kent 3b—Wallaceburg-Walpole Island Road at junction of Port Lambton Road.....	1925 1926 1927	107 73 231	13 8 29	11 9 20	17 15 17	148 106 297	197 180 715
Kent 4a—Merlin-Tilbury Road at Merlin.....	1927	657	50	129	60	896	1,095
Kent 4b—Townline Road between Tilbury East and Raleigh Townships.....	1927	577	15	166	77	835	1,094
2 5a—Tupperville Road East of Chatham.....	1925 1926 1927	158 121 153	13 2 10	21 25 25	5 2 5	197 150 193	262 196 236
3—3a—Chatham Road at Cedar Springs.....	1925 1926 1927	574 726 733	327 254 72	56 65 63	17 35 30	976 1,081 898	1,923 1,312 1,326
21 2a—Ridgetown-Highgate Road at Provincial Highway No. 21.....	1925 1926 1927	394 422 476	28 52 68	23 35 27	28 22 15	473 531 587	699 671 793
21 3a—Townline Road between Camden and Chatham Twps., at junction of Dresden-Thamesville Road.....	1927	101	3	7	15	126	220
KENT COUNTY—FALL:							
Kent 1a—Chatham-Wallaceburg Road at Cons. X and XI, Chatham Township.....	1925 1926 1927	160 334 348	2 16 18	20 54 114	44 54 54	226 473 546	304 618 737
Kent 1b—Mitchell Bay Road at junction of Chatham-Wallaceburg Road.....	1925 1926 1927	7 9 90	..... ..... 2	..... 1 83	..... 34 76	..... 44 251	35 87 370
Kent 2a—Kent Bridge-Harwich Road at junction of Northwood-Chatham Road.....	1925 1926 1927	321 95 122	43 3 3	28 5 6	31 24 17	426 127 148	640 153 179
Kent 2b—Northwood-Chatham Road at junction of Kent Bridge Road.....	1925 1926 1927	225 42 59	37 1 2	19 2 2	20 15 13	304 60 76	476 81 102
Kent 3a—Port Lambton Road at junction of Wallaceburg-Walpole Island Road.....	1925 1926 1927	Not taken. 14 177	..... 21 14	..... 3 11	..... 12 11	..... 30 213	..... 66 392
Kent 3b—Wallaceburg-Walpole Island Road at junction of Port Lambton Road.....	1925 1926 1927	12 25 251	..... 1 17	2 5 18	13 13 23	27 44 309	61 59 484

COUNTY ROAD TRAFFIC CENSUS—1925, 1926 and 1927—Continued

DAILY AVERAGE

Station and Location of Observer	Year	Ontario	Foreign	Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
Kent 4a—Merlin-Tilbury Road at Merlin.....	1927	662	10	104	.....	108	884	1,142
Kent 4b—Townline Road between Tilbury East and Raleigh Townships.....	1927	553	4	102	.....	118	777	1,064
2-5a—Tupperville Road East of Chatham.....	1925	76	.....	9	.....	11	96	146
	1926	104	10	12	.....	14	140	261
	1927	174	14	75	.....	3	266	340
3-3a—Chatham Road at Cedar Springs.....	1925	150	8	36	.....	24	218	270
	1926	336	39	61	.....	35	471	574
	1927	480	31	84	1	49	645	868
21-2a—Ridgetown-Highgate Road at Provincial Highway No. 21.....	1925	76	.....	5	.....	18	99	136
	1926	416	7	36	.....	25	484	707
	1927	787	30	43	3	32	895	1,481
21-3a—Townline Road between Camden and Chatham Twps. at junction of Dresden-Thamesville Road	1926	47	2	2	.....	30	81	107
	1927	63	2	4	.....	17	86	129
LAMBTON COUNTY—SUMMER:								
Lambton 1a—Road between Cons. 10 and 11, Plympton Township, East to Townline at Aberarder.....	1925	136	94	12	4	8	254	349
	1926	133	97	6	4	9	249	332
	1927	121	92	9	3	17	242	407
Lambton 1b—Road between Lots 18 and 19, Plympton Township, at Aberarder, traffic North.....	1926	37	7	3	.....	9	56	83
	1927	82	13	5	.....	27	127	197
Lambton 2a—Port Lambton Road, East of Becher, at intersection of Wallaceburg Road.....	1925	49	17	7	.....	6	79	144
	1926	33	12	5	.....	6	56	99
	1927	98	17	18	.....	13	146	197
Lambton 2b—Wilkesport Road, East of Becher, at intersection of Wallaceburg Road.....	1925	39	2	5	.....	13	59	74
	1926	32	.....	4	.....	8	44	59
	1927	107	5	14	.....	16	142	206

Lambton 2c—Florence Road, East of Becher, at intersection of Wallaceburg Road.....	1925 1926 1927	21 12 40	..... 1 2	1 1 3	..... ..... .....	6 3 8	28 17 53	48 31 72
Lambton 2d—Wallaceburg Road, East of Becher, at intersection of Port Lambton Road.....	1925 1926 1927	78 66 174	13 9 19	6 6 24	..... ..... .....	13 11 16	110 92 233	162 145 318
Lambton 3a—Alvinston-Oil City Road at intersection of Inwood-Shetland Road.....	1925 1926 1927	87 148 153	4 7 5	7 11 15	..... ..... .....	20 24 23	118 190 196	162 255 255
Lambton 3b—Inwood-Shetland Road at intersection of Alvinston-Oil City Road.....	1925 1926 1927	183 261 221	6 14 7	17 20 18	..... ..... .....	36 42 23	242 337 278	310 458 315
Lambton 4a—River Road at Port Lambton.....	1925 1926 1927	301 189 373	177 101 161	20 22 37	1 3	23 16 23	522 331 594	888 417 1,356
Lambton 4b—Florence Road at Port Lambton.....	1925 1926 1927	113 126 131	50 51 49	10 14 15	..... ..... .....	13 9 9	186 200 204	389 257 425
Lambton 5—St. Clair River Road at Froomfield.....	1927	445	102	38	8	13	606	946
Lambton 6—St. Clair River Road at Lot 1, Front Concession, Moore Township.....	1925 1926 1927	267 116 187	73 459 711	25 7 8	..... 1 2	8 10 4	373 593 912	757 890 1,240
7-2a—North and South traffic at 24th Sideroad West of Wisbeach.....	1927	194	344	20	2	7	567	869
LAMBTON COUNTY—FALL:								
Lambton 1a—Road between Cons. 10 and 11, Plympton Township, at Aberarder.....	1925 1926 1927	55 58 46	5 9 5	5 5 4	2 2	6 6 5	73 80 60	99 101 142
Lambton 1b—Road between Lots 18 and 19, Plympton Township, at Aberarder, traffic North.....	1925 1926 1927	28 25 48	2 3	3 4 7	..... 1 3	3 5 5	36 38 63	60 46 85
Lambton 2a—Port Lambton Road, East of Becher, at intersection of Wallaceburg Road.....	1925 1926 1927	44 69 45	3 5 4	4 11 5	..... 1	11 7 9	62 93 63	92 111 83

COUNTY ROAD TRAFFIC CENSUS—1925, 1926 and 1927—Continued

DAILY AVERAGE

Station and Location of Observer	Year	Ontario	Foreign	Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
Lambton 2b—Wilkesport Road, East of Becher, at intersection of Wallaceburg Road.....	1925 1926 1927	7 22 60	..... 1 1	1 3 6	.....	13 13 11	21 39 78	30 55 128
Lambton 2c—Florence Road, East of Becher, at intersection of Wallaceburg Road.....	1925 1926 1927	8 13 23	..... 1 1	..... 1 2	.....	10 8 8	18 23 34	39 37 43
Lambton 2d—Wallaceburg Road, East of Becher, at intersection of Port Lambton Road.....	1925 1926 1927	40 94 79	7 7 7	5 8 12	..... 1	20 21 13	72 131 111	81 202 203
Lambton 3a—Alvinston-Oil City Road at intersection of Inwood-Shetland Road.....	1925 1926 1927	33 119 158	..... 3 2	5 15 16	.....	11 28 45	49 165 221	59 209 298
Lambton 3b—Inwood-Shetland Road at intersection of Alvinston-Oil City Road.....	1925 1926 1927	158 175 225	2 4 3	19 19 18	.....	54 59 56	233 257 302	270 389 363
Lambton 4a—River Road at Port Lambton.....	1925 1926 1927	71 129 137	5 20 29	8 18 16	.....	12 31 7	96 198 189	134 247 353
Lambton 4b—Florence Road at Port Lambton.....	1925 1926 1927	85 130 114	13 20 21	10 14 13	.....	8 21 7	117 186 155	208 245 264
Lambton 5—St. Clair River Road at Froomfield.....	1925 1926 1927	269	24	27	7	11	338	580
Lambton 6—St. Clair River Road at Lot 1, Front Concession, Moore Township.....	1927	192	21	31	.....	9	253	443
7-2a—North and South traffic at 24th Sideroad, West of Wisbeach.....	1925 1926 1927	64 71 157	79 109 84	7 8 15	1 2	5 4 4	156 192 262	225 286 498

LANARK COUNTY—SUMMER:

Lanark 1a—Townline Road to Ashton Station, at junction of West Huntley Road.....	1925	6	.....	.....	.....	11	17	28
	1926	6	.....	.....	.....	11	17	24
	1927	4	.....	.....	.....	17	21	39
Lanark 1b—West Huntley Road at Townline Road.....	1925	27	.....	1	.....	9	37	67
	1926	14	.....	.....	.....	9	23	28
	1927	7	.....	.....	1	13	21	35
Lanark 2—Calabogie Road at White.....	1926	21	2	.....	1	9	34	53
	1927	32	2	.....	2	7	43	47
Lanark 3a—Almonte-Carp Road at Almonte-West Huntley Road.....	1926	369	4	.....	13	321	707	1,124
	1927	79	4	.....	6	41	130	166
Lanark 3b—Almonte-West Huntley Road at Almonte-Carp Road.....	1926	45	.....	.....	.....	23	71	95
	1927	49	1	.....	3	21	74	101
Lanark 4a—West Port Road at Darcyville Road.....	1926	35	.....	4	.....	11	50	135
	1927	23	.....	.....	.....	10	34	46
Lanark 4b—Darcyville Road at West Port Road.....	1926	54	1	.....	.....	15	71	120
	1927	48	1	.....	1	13	63	80
Lanark 5a—Franktown-Carleton Place Road at junction of Franktown-Richmond Road.....	1927	128	12	11	.....	8	159	247
Lanark 5b—Franktown-Richmond Road at junction of Franktown-Carleton Place Road.....	1927	53	1	4	.....	1	59	126
15 5a—Smith's Falls-Carleton Place Road at Carleton Place	1926	282	10	15	.....	47	354	523
29-3a—County Road at Lots 2 and 3, Con. 9, Township of Ramsay, at junction of Highway No. 29.....	1927	373	32	19	2	48	474	831
29 5a—County Road at Highway No. 29, at Pakenham.....	1927	91	2	11	.....	25	129	164
	1927	125	3	6	.....	92	226	249

LANARK COUNTY—FALL:

Lanark 1a—Townline Road at Ashton Station, at West Huntley Road.....	1925	4	.....	.....	.....	5	9	20
	1926	4	.....	.....	.....	11	16	19
	1927	8	.....	1	.....	12	21	40
Lanark 1b—West Huntley Road at Townline Road.....	1925	12	.....	1	.....	7	19	30
	1926	8	.....	2	.....	13	23	32
	1927	10	.....	3	.....	16	29	49
Lanark 2—Calabogie Road at White.....	1926	25	3	.....	.....	7	37	42
	1927	16	3	1	.....	6	26	34
Lanark 3a—Almonte-Carp Road at Almonte-West Huntley Road.....	1926	39	.....	5	.....	38	82	118
	1927	92	1	6	.....	54	153	223

COUNTY ROAD TRAFFIC CENSUS—1925, 1926 and 1927—Continued

DAILY AVERAGE

Station and Location of Observer	Year	Ontario	Foreign	Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
Lanark 3b—Almonte-West Huntley Road at Almonte-Carp Road	1926 1927	33 44	.....	2 3	.....	30 16	75 63	109 98
Lanark 4a—West Port Road at Darcyville Road	1926 1927	10 23	.....	.....	.....	10 39	20 34	26 39
Lanark 4b—Darcyville Road at West Port Road	1926 1927	26 29	.....	.....	.....	14 20	40 49	64 75
Lanark 5a—Franktown-Carleton Place Road at Franktown-Richmond Road	1927	164	2	12	.....	6	184	343
Lanark 5b—Franktown-Richmond Road at Franktown-Carleton Place Road	1927	63	.....	3	.....	1	67	161
15-5a—Smith's Falls-Carleton Place Road at Carleton Place	1926 1927	109 213	1 3	12 22	.....	49 35	171 273	291 376
29-3a—County Road at Lots 2 and 3, Con. 9, Township of Ramsay, at Highway No. 29	1927	90	.....	9	.....	18	117	207
29-5a—County Road at Pakenham, at Highway No. 29	1927	147	2	11	.....	93	253	311
LEEDS COUNTY—SUMMER:								
2-30a—Athens Road at Mallorytown	1925 1926 1927	51 55 38	4 10 18	9 3 6	.....	27 32 26	91 100 88	115 117 100
2-31a—Lynn Road, West of Brockville, at Provincial Highway No. 2	1925 1926 1927	92 94 103	16 7 6	15 17 18	1	31 21 16	155 140 143	179 172 151
15-2a—Gananoque Road at Seeley's Bay	1925 1926 1927	80 137 102	17 23 34	4 5 10	2 1	12 11 8	115 177 154	208 279 226
15-3a—Rideau Ferry Road at Lombardy	1925 1926 1927	112 148 108	39 18 17	6 5 7	.....	23 28 71	180 199 203	267 218 319
29-1a—Athens Road at Forthorn	1925 1926	40 92	2 20	10 17	.....	7 8	69 137	88 191

29-2a—Phillipsville Road at Toledo.....	1927 1925 1926 1927 1925 1926 1927	113 57 80 157 50 67 139	28 3 2 3 7	21 4 7 10 3 3 12	..... ..... ..... 1 4	13 54 50 54 22 29 44	175 115 137 225 77 104 206	285 115 204 432 116 148 299
LEEDS COUNTY—FALL:								
2-30a—Athens Road at Mallorytown moved in Fall 1927 to Rockport Road at Escott.....	1925 1926 1927	2 27 37	..... 1 6	..... 5 27	..... ..... .....	2 30 25	4 63 95	6 82 133
2-31a—Lynn Road, West of Brockville at Provincial Highway No. 2.....	1925 1926 1927	138 63 98	16 5 10	24 10 15	4 1 1	28 23 14	210 102 138	393 141 211
15-2a—Gananoque Road at Seeley's Bay.....	1925 1926 1927	31 39 110	..... ..... 3	2 3 7	..... ..... .....	8 13 11	41 55 131	68 69 215
15-3a—Rideau Ferry Road at Lombardy.....	1925 1926 1927	52 83 94	2 1 1	3 5 7	..... ..... .....	22 25 23	79 114 125	115 161 175
29-1a—Athens Road at Forthorn.....	1925 1926 1927	40 55 89	2 2 2	10 11 14	..... ..... 1	7 6 8	59 74 114	88 99 155
29-2a—Phillipsville Road at Toledo.....	1925 1926 1927	40 44 121	..... ..... 1	4 6 11	..... ..... .....	41 41 58	95 91 191	138 125 250
29-2b—County Road, No. 29, at Toledo.....	1925 1926 1927	34 64 91	..... 1 2	4 3 7	..... 1	22 32 39	60 101 139	101 135 183
LENNOX AND ADDINGTON COUNTY—SUMMER:								
Lennox and Addington 1a—Napanee Road at Adolphus- town.....	1925 1926 1927	49 77 64	5 4 2	2 4 6	..... ..... 1	15 18 13	71 103 86	114 139 157
Lennox and Addington 1b—Bath Road at Adolphustown...	1925 1926 1927	37 85 61	3 7 3	2 7 5	..... ..... 1	11 22 13	53 92 83	157 92 121
Lennox and Addington 2—North and South Road at Stella on Amherst Island.....	1925 1926 1927	21 31 45	1 ..... .....	..... 2 1	..... ..... .....	74 66 75	96 99 121	110 130 178

COUNTY ROAD TRAFFIC CENSUS—1925, 1926 and 1927—Continued

DAILY AVERAGE

Station and Location of Observer	Year	Ontario	Foreign	Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
Lennox and Addington 3a—County Road No. 4 at Milsap	1926	43	.....	2	.....	19	64	86
	1927	68	3	2	.....	16	89	140
Lennox and Addington 3b—County Road No. 12 at Milsap	1926	54	2	4	1	6	68	112
	1927	36	3	4	.....	6	49	73
Lennox and Addington 4a—Napanee-Yarker Road at East limits of Village of Camden East.....	1927	105	4	6	1	9	125	182
Lennox and Addington 4b—Road between Lots 25 and 26, Camden Township at East limits of Village of Camden East.....	1927	57	3	8	1	15	84	99
2-27a—Road between Lots 20 and 21, Ernestown Township at Provincial Highway No. 2.....	1927	43	4	6	1	1	55	69
LENNOX AND ADDINGTON COUNTIES—FALL:								
Lennox and Addington 1a—Napanee Road at Aolphustown	1925	49	.....	7	.....	16	72	140
	1926	52	.....	8	.....	16	76	120
	1927	66	1	8	.....	15	90	142
Lennox and Addington 1b—Bath Road at Adolphustown...	1925	53	.....	11	.....	16	80	126
	1926	54	.....	13	.....	23	90	121
	1927	30	1	3	.....	9	43	49
Lennox and Addington 2—North and South Road at Stella on Amherst Island.....	1925	13	.....	.....	.....	64	77	109
	1926	13	.....	.....	.....	55	68	86
	1927	53	.....	2	.....	71	126	153
Lennox and Addington 3a—County Road No. 4 at Milsap	1926	29	.....	3	.....	15	47	59
	1927	47	.....	1	.....	13	61	85
Lennox and Addington 3b—County Road No. 12 at Milsap	1926	17	.....	3	.....	8	28	46
	1927	34	1	3	.....	6	44	72
Lennox and Addington 4a—Napanee-Yarker Road at East limits of Village of Camden East.....	1927	83	.....	13	1	19	116	178
Lennox and Addington 4b—Road between Lots 25 and 26, Camden Township at East limits of Village of Camden East.....	1927	42	.....	5	.....	16	63	85
2-27a—Road between Lots 20 and 21, Ernestown Township at Provincial Highway No. 2.....	1927	28	1	5	.....	2	36	47

LINCOLN COUNTY—SUMMER:

Lincoln 1a—Canboro Road at Wellandport.....	1926	416	27	28	.....	38	509	683
Lincoln 1b—Smithville Road at Wellandport.....	1927	429	23	41	.....	43	536	231
Lincoln 1c—Forks Road at Wellandport.....	1926	247	15	19	.....	19	300	326
Lincoln 2a—Smithville Road at St. Ann's.....	1927	266	17	27	.....	22	332	737
Lincoln 2b—Beamsville Road at St. Ann's.....	1926	280	17	19	.....	22	338	837
Lincoln 2c—Wellandport Road at St. Ann's.....	1927	302	20	31	.....	27	380	450
Lincoln 3a—Smithville-Hamilton Road at junction of Smithville-Grimsby Road.....	1925	120	8	13	.....	10	151	605
Lincoln 3b—Smithville-Grimsby Road.....	1926	221	9	23	.....	20	263	469
Lincoln 3c—Smithville-Grimsby Road.....	1927	196	8	30	.....	17	251	333
Lincoln 4a—Smithville-Grimsby Road.....	1925	110	4	11	.....	8	133	216
Lincoln 4b—Smithville-Grimsby Road.....	1926	210	9	24	.....	15	258	360
Lincoln 4c—Smithville-Grimsby Road.....	1927	207	9	29	.....	9	254	496
Lincoln 5a—Smithville-Grimsby Road.....	1925	189	6	21	1	29	246	384
Lincoln 5b—Smithville-Grimsby Road.....	1926	251	14	24	.....	21	310	425
Lincoln 5c—Smithville-Grimsby Road.....	1927	246	13	31	.....	15	305	522
Lincoln 6a—Smithville-Grimsby Road.....	1925	See Lincoln 3b. (Lincoln 3a and Not taken. 3b were combined.)	14	41	.....	39	392	481
Lincoln 6b—Smithville-Grimsby Road.....	1926	298	7	25	.....	23	237	293
Lincoln 6c—Smithville-Grimsby Road.....	1925	182	33	138	.....	188	1,399	(Lin. a & b) 1,807
Lincoln 7a—Smithville-Grimsby Road.....	1926	1,040	11	30	.....	11	260	343
Lincoln 7b—Smithville-Grimsby Road.....	1927	208	90	60	.....	22	542	553
Lincoln 7c—Smithville-Grimsby Road.....	1925	370	101	72	.....	14	483	587
Lincoln 8a—Smithville-Grimsby Road.....	1926	296	166	56	.....	10	588	1,186
Lincoln 8b—Smithville-Grimsby Road.....	1927	356	24	70	.....	24	362	479
Lincoln 8c—Smithville-Grimsby Road.....	1925	244	34	96	.....	24	557	703
Lincoln 8d—Smithville-Grimsby Road.....	1926	400	110	80	3	43	921	1,543
Lincoln 8e—Smithville-Grimsby Road.....	1927	687	145	86	1	31	1,159	2,762
Lincoln 8f—Smithville-Grimsby Road.....	1925	897	113	77	.....	22	866	1,522
Lincoln 8g—Smithville-Grimsby Road.....	1926	654	3	18	.....	65	271	362
Lincoln 8h—Smithville-Grimsby Road.....	1927	185	3	23	.....	69	322	406
Lincoln 8i—Smithville-Grimsby Road.....	1925	227	6	41	.....	38	454	652
Lincoln 8j—Smithville-Grimsby Road.....	1926	369	2	9	.....	27	122	157
Lincoln 8k—Smithville-Grimsby Road.....	1927	84	2	16	.....	28	187	242
Lincoln 8l—Smithville-Grimsby Road.....	1925	141	2	24	.....	11	280	450
Lincoln 8m—Smithville-Grimsby Road.....	1926	240	5	13	.....	32	151	211
Lincoln 8n—Smithville-Grimsby Road.....	1927	103	3	18	.....	34	213	270
Lincoln 8o—Smithville-Grimsby Road.....	1925	157	4	29	.....	19	325	519
Lincoln 8p—Smithville-Grimsby Road.....	1926	272	5	29	.....	19	325	519

LINCOLN COUNTY—FALL:

Lincoln 1a—Canboro Road at Wellandport.....	1925	185	3	18	.....	65	271	362
Lincoln 1b—Smithville Road at Wellandport.....	1926	227	3	23	.....	69	322	406
Lincoln 1c—Forks Road at Wellandport.....	1927	369	6	41	.....	38	454	652
Lincoln 2a—Smithville Road at Wellandport.....	1925	84	2	9	.....	27	122	157
Lincoln 2b—Smithville Road at Wellandport.....	1926	141	2	16	.....	28	187	242
Lincoln 2c—Forks Road at Wellandport.....	1927	240	5	24	.....	11	280	450
Lincoln 2d—Forks Road at Wellandport.....	1925	103	3	13	.....	32	151	211
Lincoln 2e—Forks Road at Wellandport.....	1926	157	4	18	.....	34	213	270
Lincoln 2f—Forks Road at Wellandport.....	1927	272	5	29	.....	19	325	519

COUNTY ROAD TRAFFIC CENSUS—1925, 1926 and 1927—Continued

DAILY AVERAGE

Station and Location of Observer	Year	Ontario	Foreign	Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
Lincoln 2a—Smithville Road at St. Ann's.....	1925	104	.....	23	.....	25	152	212
	1926	199	3	32	.....	39	273	379
	1927	209	5	32	.....	21	267	388
	1925	92	.....	24	.....	19	135	166
Lincoln 2b—Beamsville Road at St. Ann's.....	1926	169	4	34	.....	41	248	381
	1927	227	5	34	.....	18	284	504
	1925	106	.....	26	.....	24	156	185
	1926	241	4	34	.....	54	336	513
Lincoln 2c—Wellandport Road at St. Ann's.....	1927	227	4	35	.....	18	284	486
	1925	102	1	19	.....	27	149	187
	1926	265	1	108	.....	206	580	786
	1927	328	5	58	.....	44	435	670
Lincoln 3a—Smithville-Hamilton Road at junction of Smithville-Grimsbv Road.....	1925	76	2	14	.....	14	106	149
	1926	263	2	39	.....	73	377	453
	1927	189	2	33	.....	14	238	363
	1925	203	21	44	2	17	287	326
8-2c—Niagara-on-the-Lake Road at St. David's....	1926	225	21	87	.....	21	354	487
	1927	276	53	88	.....	9	426	603
	1925	153	2	30	2	20	207	303
	1926	274	10	176	.....	55	515	580
8-3a—County Road at Jordan Corners.....	1927	362	16	202	1	55	636	743
	1925	156	3	48	.....	21	228	308
	1926	187	8	59	.....	25	279	387
	1927	235	12	65	.....	31	343	472
8-4a—Grimsbv Park Road at Provincial Highway No. 8..	1925	73	7	5	.....	30	115	144
	1926	58	11	5	.....	30	104	129
	1927	39	3	7	.....	14	63	82
MIDDLESEX COUNTY—SUMMER: Middlesex 1a—Townline Road between West Williams and McGillivray Townships at Con. 21, Lots 25 and 26, McGillivray Township.....	1925	73	7	5	.....	30	115	144
	1926	58	11	5	.....	30	104	129
	1927	39	3	7	.....	14	63	82
	1927	39	3	7	.....	14	63	82

Middlesex 1b—21st Concession Road at Townline Road between West Williams and McGillivray Townships.....	1925 1926 1927	38 41 29	3 7 1	3 3 2	..... ..... .....	22 27 14	66 78 46	104 98 60
Middlesex 2a—London-Dorchester Road at Nilestown.....	1925 1926 1927	329 209 375	26 13 12	51 23 58	..... ..... .....	15 8 9	421 253 454	675 308 738
Middlesex 2b—Nilestown-Belmont Road at Nilestown.....	1925 1926 1927	177 161 237	7 8 7	32 20 40	..... ..... .....	12 10 8	228 199 292	328 238 437
2-6a—County Road at Wardsville, North and South.....	1925 1926 1927	208 252 45	18 45	21 ..... .....	..... ..... .....	50 30 23	297 408 131	355 465 141
2-7a—Strathroy Road at Christina.....	1925 1926 1927	89 78 78	4 6 6	15 6 6	..... ..... .....	14 15 15	104 105 104	120 154 154
2-9a—Wyton Road at Provincial Highway No. 2.....	1925 1926 1927	138 134 126	13 10 9	16 19 24	..... ..... .....	6 2 3	173 165 162	194 242 203
4-3a—County Road at Concessions 4 and 5, London Township, North of London.....	1925 1926 1927	980 168 194	489 21 9	62 19 21	6	23 15 17	1,560 223 241	2,613 292 317
7-3a—Kerwood Road at Highway No. 7.....	1925 1926 1927	54 50 86	4 7 6	2 6 6	1	14 12 18	75 75 116	98 107 119
7-4a—Main Street at Parkhill.....	1927	481	60	56	6	109	712	972
22-1a—Poplar Hill-Delaware Road at Poplar Hill.....	1925 1926 1927	218 155 137	19 23 11	15 12 8	..... ..... .....	22 11 9	274 201 164	354 238 242
MIDDLESEX COUNTY—FALL:								
Middlesex 1a—Townline Road between West Williams and McGillivray Townships at Concession 21, Lots 25 and 26, McGillivray Township.....	1925 1926 1927	38 33 53	..... 1 1	3 2 2	..... ..... 1	28 22 19	69 58 76	130 85 115
Middlesex 1b—Twenty-first Concession Road at Townline Road between West Williams and McGillivray Townships.....	1925 1926 1927	23 33 29	..... 1	1 2 2	..... ..... .....	22 22 10	46 58 41	98 85 58
Middlesex 2a—London-Dorchester Road at Nilestown.....	1925 1926 1927	204 271 370	..... 1 1	35 38 65	..... ..... .....	15 12 12	254 322 449	288 363 682

COUNTY ROAD TRAFFIC CENSUS—1925, 1926 and 1927—Continued

DAILY AVERAGE

Station and Location of Observer	Year	Ontario	Foreign	Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
Middlesex 2b—Nilestown-Belmont Road at Nilestown...	1925	128	.....	23	.....	9	160	206
	1926	166	.....	25	.....	11	202	219
	1927	219	.....	46	.....	12	277	397
2-6a—County Road at Wardville, North and South.....	1925	213	14	20	.....	52	299	401
	1926	Under construction.	.....	.....	.....	.....	.....	.....
	1927	197	14	27	.....	33	271	365
2-7a—Strathroy Road at Christina.....	1925	64	1	9	.....	17	91	120
	1926	77	1	11	.....	10	99	145
	1927	86	3	10	.....	7	106	182
2-9a—Wyton Road at Provincial Highway No. 2.....	1925	108	3	20	1	7	139	176
	1926	95	3	19	.....	4	121	146
	1927	98	1	22	.....	3	124	241
4-3a—County Road at Concessions 4 and 5, London Township, North of London.....	1925	503	13	53	3	27	599	733
	1926	174	8	33	.....	17	232	309
	1927	231	6	38	.....	24	299	404
7-3a—Kerwood Road at Highway No. 7.....	1925	39	.....	2	.....	19	60	82
	1926	51	3	4	.....	28	86	105
	1927	105	6	9	.....	38	158	198
7-4a—Main Street at Parkhill.....	1927	457	28	34	5	84	608	747
22-1a—Poplar Hill-Delaware Road at Poplar Hill.....	1925	139	3	29	.....	18	189	304
	1926	99	3	18	.....	14	134	160
	1927	128	3	31	.....	11	173	210
NORFOLK COUNTY—SUMMER:								
Norfolk 1a—Simcoe-Port Dover Road at Vittoria Road...	1925	875	44	61	.....	20	1,000	1,680
	1926	1,055	66	75	7	15	1,218	1,648
	1927	1,109	87	87	8	11	1,302	2,401
Norfolk 1b—Vittoria Road at Simcoe-Port Dover Road...	1925	397	16	35	.....	15	463	551
	1926	450	28	40	6	10	534	661
	1927	474	30	48	8	8	568	939
Norfolk 2a—Waterford Road at Windham Centre.....	1925	160	7	17	.....	43	227	268
	1926	174	2	30	.....	30	236	291
	1927	214	5	31	.....	27	277	351

Norfolk 2b—Teeterville Road at Windham Centre.....	1925	102	5	14	20	141	180
	1926	110	1	21	19	151	181
	1927	121	2	19	18	160	200
Norfolk 3a—Townline Road between Houghton and Walsingham Townships at junction of County Road No. 7.....	1927	159	2	13	9	183	348
Norfolk 3b—County Road No. 7 at junction of Townline Road between Houghton and Walsingham Townships.....	1927	94	1	4	7	107	231
	1925	197	16	37	71	321	345
	1926	208	10	41	67	326	399
	1927	256	5	55	54	370	439
3-9a—County Road at Courtland.....	1925	161	11	9	29	210	292
	1926	421	115	44	33	620	804
	1927	171	4	24	27	227	316
3-10a—Port Dover Road at Renton.....							
NORFOLK COUNTY—FALL:							
Norfolk 1a—Simcoe-Port Dover Road at Vittoria Road.....	1925	355	2	34	13	404	510
	1926	180	7	38	9	239	298
	1927	534	12	63	10	628	894
Norfolk 1b—Vittoria Road at Simcoe-Port Dover Road.....	1925	214	2	20	11	247	364
	1926	401	7	30	6	449	783
	1927	261	5	40	6	318	449
Norfolk 2a—Waterford Road at Windham Centre.....	1925	110	1	16	29	156	194
	1926	146	2	31	21	200	247
	1927	163	2	45	18	228	289
Norfolk 2b—Teeterville Road at Windham Centre.....	1925	64	.....	15	36	115	143
	1926	79	1	16	11	107	148
	1927	104	1	28	12	145	229
Norfolk 3a—Townline Road between Houghton and Walsingham Townships at County Road No. 7.....	1927	113	2	12	14	141	183
Norfolk 3b—County Road No. 7 at Townline Road between Houghton and Walsingham Townships.....	1927	82	1	6	9	98	138
	1925	154	1	27	75	257	363
	1926	150	2	41	55	248	319
	1927	220	4	47	42	313	346
3-9a—County Road at Courtland.....	1925	193	3	14	41	251	308
	1926	114	1	16	36	167	249
	1927	148	1	23	20	192	214
3-10a—Port Dover Road at Renton.....							
NORTHUMBERLAND AND DURHAM COUNTIES—SUMMER:							
Durham 1a—Newcastle-Lindsay Road at Kirby.....	1925	85	5	4	15	109	182
	1926	218	7	13	37	275	375
	1927	223	2	20	26	271	429

COUNTY ROAD TRAFFIC CENSUS—1925, 1926 and 1927—Continued

DAILY AVERAGE

Station and Location of Observer	Year	Ontario	Foreign	Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
Durham 1b—Kendal Road at Kirby.....	1925	19	1	2	.....	11	33	46
	1926	51	.....	4	.....	25	80	110
	1927	39	.....	5	.....	15	59	142
	1927	68	2	5	.....	14	89	175
Durham 2—Kendal Road at Starkville.....								
Northumberland 1a—Trenton Road at Wooler, East and West.....	1927	196	7	38	.....	42	283	346
Northumberland 1b—Frankford Road at Wooler, North and South.....	1927	109	5	20	.....	12	146	224
2-22a—Canton Road at Welcome Corner.....	1925	127	3	12	1	29	172	200
	1926	214	11	12	.....	36	273	359
	1927	219	16	19	.....	35	289	367
NORTHUMBERLAND AND DURHAM COUNTIES—FALL:								
Durham 1a—Newcastle-Lindsay Road at Kirby.....	1925	77	1	4	.....	16	98	134
	1926	128	8	17	.....	27	180	278
	1927	187	1	17	.....	31	236	401
Durham 1b—Kendal Road at Kirby.....	1925	15	.....	1	1	15	31	61
	1926	28	.....	6	.....	17	51	73
	1927	32	.....	5	.....	23	60	99
	1927	82	.....	10	.....	53	145	178
Durham 2—Kendal Road at Starkville.....								
Northumberland 1a—Trenton Road at Wooler, East and West.....	1927	269	2	69	.....	52	392	526
Northumberland 1b—Frankford Road at Wooler, North and South.....	1927	138	1	28	.....	27	194	264
2-22a—Canton Road at Welcome Corner.....	1925	99	1	17	.....	41	158	220
	1926	87	.....	12	.....	34	133	211
	1927	399	12	39	3	29	482	914
ONTARIO COUNTY—SUMMER:								
Ontario 1a—Scugog Road at junction of Port Perry-Nestle-	1925	174	6	15	.....	25	220	364
ton Station Road.....	1926	319	5	24	.....	36	384	543
	1927	220	8	19	.....	18	265	423
Ontario 1b—Port Perry-Nestleton Road at junction of Scugog Road.....	1925	152	.....	15	.....	15	182	324

12-2a—Port Perry Road at Manchester Corner,	1926	192	5	14	.....	16	227	392
	1927	142	5	19	.....	10	186	237
	1925	318	8	21	.....	26	373	700
	1926	455	13	28	.....	23	832	519
	1927	320	11	27	1	26	385	607
ONTARIO COUNTY—FALL:								
Ontario 1a—Scugog Road at junction of Port Perry-Nestleton Station Road,	1925	66	.....	12	.....	35	113	150
	1926	84	.....	12	.....	22	118	201
	1927	173	1	16	.....	26	216	319
Ontario 1b—Port Perry-Nestleton Station Road at junction of Scugog Road,	1925	41	.....	4	.....	13	58	107
	1926	66	.....	11	.....	10	87	151
	1927	118	1	12	.....	11	142	198
12-2a—Port Perry Road at Manchester Corner,	1925	147	13	13	.....	34	194	279
	1926	181	.....	16	.....	3	217	331
	1927	160	1	18	.....	20	199	336
OXFORD COUNTY—SUMMER:								
Oxford 1a—Ingersoll-Tillsonburg Road at Salford,	1925	313	26	42	4	83	467	619
	1926	358	35	43	5	76	517	634
	1927	389	37	48	5	84	563	693
Oxford 1b—Salford-Burgessville Road at Salford,	1925	56	3	7	.....	50	116	153
	1926	71	6	14	.....	43	134	166
	1927	413	7	13	.....	50	183	213
Oxford 2a—Embro-Beachville Road at County Road No. 17,	1925	149	5	12	.....	13	179	276
	1926	148	5	18	.....	13	184	213
	1927	66	1	13	.....	3	83	102
Oxford 2b—County Road No. 17 at junction of Embro-Beachville Road,	1925	123	6	13	.....	13	155	183
	1926	132	5	14	.....	14	166	192
	1927	71	1	5	.....	8	85	125
Oxford 3a—Harrington Road at junction of Embro Road, ..	1925	107	6	8	.....	21	142	170
	1926	118	3	14	.....	16	151	183
	1927	100	3	16	.....	19	137	172
Oxford 3b—Embro Road at junction of Harrington Road, ..	1925	116	6	8	.....	17	147	219
	1926	139	4	15	.....	17	174	204
	1927	121	4	15	.....	15	155	186
2-11a—Burford Road at Eastwood,	1925	267	282	20	.....	8	577	725
	1926	110	12	17	.....	9	148	196
	1927	157	16	61	2	5	241	343

COUNTY ROAD TRAFFIC CENSUS—1925, 1926 and 1927—Continued

DAILY AVERAGE

Station and Location of Observer	Year	Ontario	Foreign	Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
OXFORD COUNTY—FALL:								
Oxford 1a—Ingersoll-Tillsonburg Road at Salford.....	1925	246	15	29	4	80	374	510
	1926	295	15	37	4	72	423	475
	1927	397	22	46	3	66	534	718
Oxford 1b—Salford-Burgessville Road at Salford.....	1925	59	8	8		52	124	168
	1926	73	6	14		45	138	170
	1927	126	6	12		44	188	250
Oxford 2a—Embro-Beachville Road at County Road No. 17	1925	69		8		7	84	114
	1926	69		11		12	122	158
	1927	71		16		7	94	123
Oxford 2b—County Road No. 17 at Embro-Beachville Road	1925	59		6		7	72	92
	1926	88		15		14	117	163
	1927	55		6		4	65	108
Oxford 3a—Harrington Road at Embro Road.....	1925	104		9	1	23	137	201
	1926	99		11		19	129	153
	1927	108	1	12		18	139	186
Oxford 3b—Embro Road at Harrington Road.....	1925	105		8	1	23	137	193
	1926	108	1	9		16	134	176
	1927	124	2	13		14	153	227
Oxford 4a—Woodstock-Tavistock Road at County Road No. 17.....	1927	409	1	49		39	498	643
Oxford 4b—County Road No. 17 at Woodstock-Tavistock Road.....	1927	128		17		18	163	208
2-11a—Burford Road at Eastwood.....	1925	46	2	9		12	69	80
	1926	68	2	27		7	104	139
2-9½a—Lakeside Road at Thamesford.....	1927	180	28	79	3	27	297	425
2-9½b—Governor's Road, traffic east of Thamesford.....	1927	209	4	32		27	272	348
	1927	63		5		14	82	106
PEEL COUNTY—SUMMER:								
Peel 1—Belfountain-Cheltenham Road at Belfountain.....	1925	100	1	3		23	127	297
	1926	279	3	4		60	346	583
	1927	201	10	13		48	272	502

PEEL COUNTY—FALL:		1925	38	.....	3	.....	31	72	158
Peel 1—Belfountain-Cheltenham Road at Belfountain.....		1926	50	.....	5	.....	47	102	150
		1927	189	5	21	.....	44	259	705
PERTH COUNTY—SUMMER:									
7-7a—Fairview Road south of Stratford at Provincial Highway No. 7.....		1925	118	2	8	.....	17	145	197
		1926	128	2	10	.....	15	155	185
		1927	119	2	10	.....	10	142	188
7-8a—Tavistock Road at Shakespeare.....		1925	245	6	14	1	19	284	484
		1926	310	5	35	.....	21	371	426
		1927	456	14	37	.....	20	527	851
8-8a—St. Mary's Road east of Sebringville.....		1925	72	3	5	.....	12	92	114
		1926	83	1	5	.....	22	111	158
		1927	103	2	11	.....	21	137	160
8-9a—County Road at Dublin, junction of Provincial Highway No. 8.....		1927	268	15	24	.....	96	403	625
PERTH COUNTY—FALL:									
7-7a—Fairview Road south of Stratford at Provincial Highway No. 7.....		1925	85	1	8	.....	23	117	139
		1926	97	1	12	.....	14	124	163
		1927	118	1	7	.....	12	138	219
7-8a—Tavistock Road at Shakespeare.....		1925	190	1	20	.....	42	253	407
		1926	371	1	30	1	34	437	832
		1927	508	7	48	.....	25	588	1,112
8-8a—St. Mary's Road east of Sebringville.....		1925	57	4	6	.....	137	87	137
		1926	64	.....	6	.....	25	95	121
		1927	76	.....	13	.....	17	106	144
8-9a—County Road at Dublin, junction of Provincial Highway No. 8.....		1927	203	4	38	.....	103	348	438
PETERBOROUGH COUNTY—SUMMER:									
Peterborough 1a—Block Road at Norwood Road.....		1925	28	.....	4	.....	7	39	15
		1926	19	.....	3	.....	2	24	37
		1927	10	.....	.....	.....	2	14	21
Peterborough 1b—Norwood Road at Block Road.....		1925	188	9	23	1	3	224	296
		1926	228	11	24	1	5	269	362
		1927	247	45	24	.....	6	322	458
Peterborough 1c—Keene Road at Block Road.....		1925	Not taken	.....	.....	.....	.....	.....	.....
		1926	30	1	4	.....	3	38	57
		1927	226	19	25	.....	16	286	381

COUNTY ROAD TRAFFIC CENSUS—1925, 1926 and 1927—Continued

DAILY AVERAGE

Station and Location of Observer	Year	Ontario	Foreign	Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
7-19a—Chemong Road north of Highway No. 7.....	1925 1926 1927	670 521 538	43 38 38	57 38 34	15 13 3	21 15 19	806 625 632	1,103 851 819
28-2a—County Road at Concessions 6 and 7, Monaghan Township south of Peterborough.....	1925 1926 1927	13 21 21	..... 1 5	1 3 8	..... ..... .....	7 12 15	12 37 49	15 45 56
PETERBOROUGH COUNTY—FALL:								
Peterborough 1a—Block Road at Norwood Road.....	1925 1926 1927	19 7 17	..... ..... .....	3 2 2	..... ..... .....	5 2 5	27 11 24	42 15 39
Peterborough 1b—Norwood Road at Block Road.....	1925 1926 1927	125 131 276	..... 2 2	23 26 36	..... ..... 1	7 4 1	155 163 324	222 266 444
Peterborough 1c—Keene Road at Block Road.....	1926 1927	21 34	..... .....	4 6	..... .....	1 2	26 42	44 65
7-19a—Chemong Road north of Highway No. 7.....	1925 1926 1927	143 196 373	..... 4 12	18 44 39	..... 1	18 38 16	191 283 440	296 395 772
28-2a—County Road at Concessions 6 and 7, Monaghan Township south of Peterborough.....	1925 1926 1927	4 17 27	..... ..... .....	1 2 1	..... ..... .....	7 13 12	12 32 40	18 41 64
PRESCOTT COUNTY—SUMMER:								
Prescott 1a—County Road No. 9 at junction of County Road No. 10, North and South.....	1927	145	8	9	.....	28	190	356
Prescott 1b—County Road No. 10 at junction of County Road No. 9, East.....	1927	106	6	8	.....	20	140	265
17-2a—County Road 1 mile west of Alfred at junction of Provincial Highway No. 17.....	1925 1926 1927	47 59 62	7 5 4	1 8 8	8 3	127 89 87	189 164 161	254 216 235

PRESCOTT COUNTY—FALL:									
Prescott 1a—County Road No. 9 at County Road No. 10, North and South.....	1927	138	9	11	.....	21	179	281	
Prescott 1b—County Road No. 10 at County Road No. 9, East.....	1927	83	5	6	.....	17	111	170	
17-2a—County Road, 1 mile west of Alfred at junction of Provincial Highway No. 17.....	1925	33	1	2	4	60	100	145	
	1926	44	3	4	2	80	133	170	
	1927	57	6	7	.....	79	149	200	
PRINCE EDWARD COUNTY—SUMMER:									
Prince Edward 1a—High Shore Road at junction of Demorestville Road.....	1926	90	5	5	.....	18	118	176	
	1927	83	4	5	.....	15	107	166	
Prince Edward 1b—Demorestville Road at junction of High Shore Road.....	1926	167	4	26	.....	40	245	301	
	1927	153	3	30	1	45	232	365	
Prince Edward 2a—County Road No. 1 at junction of Bay Road near Murray Bay.....	1927	75	4	22	.....	17	118	191	
Prince Edward 2b—Bay Road at junction of County Road No. 1.....	1927	213	8	31	1	36	289	391	
14-1a—Wellington Road at Bloomfield.....	1925	323	11	31	1	59	425	590	
	1926	357	18	23	.....	77	475	655	
	1927	366	15	33	1	82	497	615	
14-2a—Carrying Place Road at Rossmore.....	1925	238	15	42	.....	45	340	549	
	1926	167	5	20	.....	32	224	327	
	1927	183	7	25	.....	26	241	316	
PRINCE EDWARD COUNTY—FALL:									
Prince Edward 1a—High Shore Road at Demorestville.....	1926	55	.....	6	.....	22	83	130	
	1927	92	1	7	.....	27	127	183	
Prince Edward 1b—Demorestville Road at High Shore Road.....	1926	132	1	17	.....	48	198	345	
	1927	173	.....	15	.....	47	235	300	
14-1a—Wellington Road at Bloomfield.....	1925	203	.....	23	3	56	285	333	
	1926	192	1	19	2	56	270	346	
	1927	356	2	38	4	57	457	554	
14-2a—Carrying Place Road at Rossmore.....	1925	80	1	19	.....	33	133	198	
	1926	130	5	29	.....	33	197	311	
	1927	179	.....	46	.....	31	256	388	
RENFREW COUNTY—SUMMER:									
Renfrew 1—Renfrew-Douglas Road at McDougal.....	1925	111	2	9	.....	27	149	258	
	1926	159	11	11	1	27	209	253	
	1927	123	5	13	.....	37	178	253	

COUNTY ROAD TRAFFIC CENSUS—1925, 1926 and 1927—Continued

DAILY AVERAGE

Station and Location of Observer	Year	Ontario	Foreign	Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
Renfrew 2—Pembroke-Douglas Road at Rankin.....	1925	135	3	6	.....	41	185	337
	1926	194	6	7	4	35	246	434
	1927	299	15	25	2	78	419	520
Renfrew 3—Westmeath Road at Lapasse Road.....	1925	37	13	6	.....	26	72	83
	1926	33	.....	4	.....	24	61	70
	1927	25	.....	2	.....	20	45	66
Renfrew 3a—Lapasse Road at Westmeath Road.....	1925	51	3	4	.....	36	94	113
	1926	33	.....	2	.....	22	57	69
	1927	26	.....	3	.....	16	45	66
17-1a—Beachburg Road at Lot 7, Cons. 1 and 2, Ross Twp.	1925	233	14	11	4	84	346	465
	1926	256	11	16	.....	77	418	514
	1927	311	30	18	1	78	438	514
17-2a—County Road at Lot 21, Con. 1, Admaston Twp...	1925	70	2	6	.....	16	94	130
	1926	58	1	4	.....	11	74	109
	1927	67	2	3	.....	10	82	112
RENFREW COUNTY—FALL:								
Renfrew 1—Renfrew-Douglas Road at McDougal.....	1925	87	3	7	.....	21	118	139
	1926	94	1	8	1	17	121	162
	1927	129	2	6	.....	20	157	234
Renfrew 2—Pembroke-Douglas Road at Rankin.....	1925	74	1	7	.....	39	121	137
	1926	141	9	13	1	41	205	275
	1927	249	10	22	6	71	358	446
Renfrew 3—Westmeath Road at Lapasse Road.....	1925	27	.....	2	.....	32	61	97
	1926	31	.....	3	.....	41	75	94
	1927	30	1	3	.....	27	61	83
Renfrew 3a—Lapasse Road at Westmeath Road.....	1925	18	.....	1	.....	29	48	78
	1926	29	.....	3	.....	33	65	85
	1927	36	.....	2	3	31	72	93
17-1a—Beachburg Road at Lot 7, Cons. 1 and 2, Ross Twp.	1925	112	2	6	.....	96	216	367
	1926	147	3	10	.....	65	225	298
	1927	264	5	14	.....	105	388	504
17-2a—County Road at Lot 21, Con. 1, Admaston Twp...	1925	36	.....	2	.....	10	48	60
	1926	51	1	4	.....	11	67	94
	1927	71	1	6	.....	9	87	115

RUSSELL COUNTY - SUMMER:									
Russell 1a--Townline Road between Russell and Cumberland Townships, at Russell Road.....	1926 1927	20 19	1	3	.....	.....	.....	17 23	41 42
Russell 2a--Embrun-Casselman Road at junction of Townline Road between Russell and Cambridge Twps.	1927	96	8	9	.....	.....	.....	52	165
Russell 2b--Townline Road between Russell and Cambridge Twps. at junction of Embrun-Casselman Road.....	1927	24	1	3	.....	.....	.....	32	60
RUSSELL COUNTY - FALL:									
Russell 1a--Townline Road between Russell and Cumberland Townships.....	1927	20	.....	2	.....	.....	.....	15	37
Russell 2a--Embrun-Casselman Road at Townline Road between Russell and Cambridge Townships.....	1927	102	3	14	.....	.....	.....	56	176
Russell 2b--Townline Road between Russell and Cambridge Townships at the Embrun-Casselman Road.....	1927	51	1	8	.....	.....	.....	42	102
SIMCOE COUNTY - SUMMER:									
Simcoe 1a--Alliston Road at Cookstown.....	1927	310	4	43	.....	.....	.....	36	393
Simcoe 1b--Bond Head Road at Cookstown.....	1927	347	5	31	.....	.....	.....	41	424
11-4a--Penetang Road at Crown Hill.....	1925	211	19	15	.....	.....	.....	18	263
	1926	424	56	14	.....	4	.....	20	518
	1927	398	55	15	.....	.....	.....	8	477
11-5a--County Road at South limits of Orillia.....	1925	216	8	29	.....	1	.....	33	287
	1926	267	7	30	.....	2	.....	33	339
	1927	268	9	26	.....	1	.....	26	328
11-6a--Sparrow Lake Road at Provincial Highway No. 11	1925	98	2	2	.....	.....	.....	1	110
	1926	143	15	8	.....	.....	.....	1	167
	1927	123	10	7	.....	1	.....	3	144
	1925	284	14	8	.....	1	.....	27	334
	1926	192	1	5	.....	1	.....	24	384
	1927	199	5	10	.....	1	.....	23	238
26-2a--Brentwood-Collingwood Road at Sunnidale Corners									
SIMCOE COUNTY--FALL:									
Simcoe 1a--Alliston Road at Cookstown.....	1927	459	.....	59	.....	5	.....	52	575
Simcoe 1b--Bond Head Road at Cookstown.....	1927	489	.....	63	.....	5	.....	59	616
11-4a--Penetang Road at Crown Hill.....	1925	127	.....	9	.....	.....	.....	26	162
	1926	180	1	12	.....	.....	.....	17	308
	1927	233	4	14	.....	1	.....	11	210
	1925	124	1	22	.....	.....	.....	11	263
	1926	160	.....	27	.....	1	.....	32	179
11-5a--County Road at South limits of Orillia.....	1927	190	.....	32	.....	1	.....	35	223
	1925	31	2	1	.....	1	.....	36	261
	1926	14	1	.....	.....	.....	.....	3	35
11-6a--Sparrow Lake Road at Provincial Highway No. 11	1927	34	.....	5	.....	.....	.....	1	16
								3	42

COUNTY ROAD TRAFFIC CENSUS—1925, 1926 and 1927—Continued

DAILY AVERAGE

Station and Location of Observer	Year	Ontario	Foreign	Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
26-2a—Brentwood-Collingwood Road at Sunnisdale Corners	1925	171	1	6	.....	39	217	261
	1926	75	.....	5	.....	13	93	112
	1927	181	2	14	.....	29	226	321
STORMONT COUNTY—SUMMER:								
Stormont 1a—Cornwall Road at Monklands.....	1927	123	7	7	.....	34	171	216
Stormont 1b—Finch Road at junction of Cornwall Road, at Monklands.....	1927	163	7	14	.....	46	230	290
STORMONT COUNTY—FALL:								
Stormont 1a—Cornwall Road at Monklands.....	1927	125	8	9	.....	27	169	242
Stormont 1b—Finch Road at Monklands.....	1927	147	5	11	.....	39	202	250
VICTORIA COUNTY—SUMMER:								
Victoria 1a—Bobcaygeon Road at junction of Downeyville Road.....	1927	477	39	26	.....	39	581	817
Victoria 1b—Downeyville Road at junction of Bobcaygeon Road.....	1927	215	9	21	.....	59	304	440
7-17a—Little Britain Road at west limits of Lindsay	1925	356	9	34	.....	28	427	524
	1926	424	8	24	.....	22	478	570
	1927	481	13	46	.....	33	573	660
7-18a—Newcastle Road, south of Lindsay, at Provincial Highway No. 7.....	1925	218	4	12	.....	29	263	383
	1926	266	3	16	1	25	310	461
	1927	157	3	16	.....	25	201	276
VICTORIA COUNTY—FALL:								
Victoria 1a—Bobcaygeon Road at junction of Downeyville Road.....	1927	272	2	19	.....	34	327	472
Victoria 1b—Downeyville Road at junction of Bobcaygeon Road.....	1927	229	.....	19	.....	66	314	441
7-17a—Little Britain Road at west limits of Lindsay	1925	281	1	27	.....	36	345	468
	1926	245	.....	31	.....	31	307	405
	1927	410	1	50	.....	30	491	595
7-18a—Newcastle Road, south of Lindsay, at Provincial Highway No. 7.....	1925	145	.....	18	.....	30	193	282
	1926	247	.....	21	.....	32	300	416
	1927	258	.....	21	.....	33	312	656

WATERLOO COUNTY—SUMMER:

Waterloo 1a—Waterloo-Elmira Road at St. Clements Road	1925	818	53	65	8	86	1,031	1,864
	1926	954	25	71	8	60	1,118	1,626
	1927	924	23	89	9	95	1,140	1,767
Waterloo 1b—St. Clements Road at Elmira Road	1925	328	25	30	.....	38	441	707
	1926	352	7	28	.....	28	415	564
	1927	355	3	34	.....	59	451	725
Waterloo 2a—West Montrose-Winterbourne Road at junction of West Montrose-Guelph Road	1925	105	2	12	1	40	161	195
	1926	99	2	10	.....	129	240	305
	1927	113	1	12	.....	27	153	209
Waterloo 2b—West Montrose-Guelph Road at junction of West Montrose-Winterbourne Road	1925	102	1	13	.....	29	146	194
	1926	100	2	10	.....	120	232	308
	1927	117	1	12	.....	25	155	195
7-9a—Wellesley Road at Baden	1925	60	3	10	.....	15	88	131
	1926	144	4	16	.....	19	183	241
	1927	95	2	95	2	13	207	297
7-10a—Preston-Conestogo Road east of Kitchener	1925	160	19	24	.....	38	241	263
	1926	151	2	22	.....	34	209	237
	1927	98	3	14	.....	13	128	238
24-4a—Ayr Road at Paris-Galt Highway	1927	29	1	5	.....	7	42	68
24-5a—Preston Road at Paris-Galt Highway	1927	531	5	71	.....	10	617	1,079

WATERLOO COUNTY—FALL:

Waterloo 1a—Waterloo-Elmira Road at St. Clements Road	1925	262	3	30	8	41	344	558
	1926	610	4	58	10	66	748	1,114
	1927	779	3	63	10	44	899	1,709
Waterloo 1b—St. Clements Road at Elmira Road	1925	175	2	18	.....	57	252	349
	1926	204	1	20	.....	39	264	374
	1927	260	1	22	.....	26	309	532
Waterloo 2a—West Montrose-Winterbourne Road at West Montrose-Guelph Road	1925	54	.....	10	.....	37	101	151
	1926	70	2	10	.....	20	102	129
	1927	77	.....	8	.....	29	114	218
Waterloo 2b—West Montrose-Guelph Road at West Montrose-Winterbourne Road	1925	62	.....	11	.....	38	111	168
	1926	75	.....	11	.....	22	108	139
	1927	91	.....	11	.....	24	126	232
7-9a—Wellesley Road at Baden	1925	9	.....	2	.....	15	26	34
	1926	Under construction.	.....	.....	.....	.....	.....	.....
	1927	147	2	23	2	7	181	367
7-10a—Preston-Conestogo Road east of Kitchener	1925	104	1	20	.....	52	177	272
	1926	155	.....	53	.....	65	273	327
	1927	Under construction.	.....	.....	.....	.....	.....	.....

COUNTY ROAD TRAFFIC CENSUS—1925, 1926 and 1927—Continued

DAILY AVERAGE

Station and Location of Observer	Year	Ontario	Foreign	Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
24-4a—Ayr Road at Paris-Galt Highway.....	1927	29	1	5	.....	7	42	68
24-5a—Preston Road at Galt-Guelph Highway.....	1927	531	5	71	.....	10	617	1,079
WELLAND COUNTY—SUMMER:								
Welland 1a—Canboro Road at Fenwick, East and West....	1927	497	29	101	.....	34	661	871
Welland 1b—South Pelham Road at Fenwick, South.....	1927	229	16	42	.....	16	303	469
Welland 2a—Crowland Road at Cooks Mills, East and West	1927	535	107	78	4	9	733	942
Welland 2b—Humberstone Road at Cooks Mills, South....	1927	328	97	54	6	5	490	620
3-14a—County Road at Lots 39 and 40, Wainfleet Township at junction of Provincial Highway No. 3...	1925	107	7	18	.....	5	137	249
	1926	578	185	53	3	18	837	1,525
	1927	290	24	37	.....	8	359	569
3-17a—Montrose Road at Lundy's Lane.....	1925	364	71	49	3	31	518	693
	1926	299	59	42	.....	18	418	722
	1927	753	367	111	11	14	1,256	2,167
3A-3a—Ridgeway Road at Garrison Road.....	1925	500	1,644	98	32	19	2,293	2,461
	1926	975	1,607	106	22	14	2,724	3,126
	1927	675	3,854	133	35	10	4,707	7,076
3A-3B—Chippewa Road at Garrison Road.....	1925	275	211	41	3	16	546	691
	1926	570	526	57	3	13	1,169	1,813
	1927	423	405	57	4	6	895	1,770
8-1a—Thorold Road at South End Corner.....	1925	588	100	123	1	16	828	977
	1926	364	82	86	1	10	543	613
	1927	800	548	108	12	17	1,485	2,357
8-1b—Portage Road at South End Corner.....	1925	559	194	129	1	23	906	1,170
	1926	468	133	109	.....	19	729	1,022
Niagara Falls Boulevard, near Bridgeburg.....	1927	Under construction.						
	1926	487	518	39	4	6	1,054	1,840
	1927	895	1,355	89	35	4	2,378	4,208
WELLAND COUNTY—FALL:								
Welland 1a—Canboro Road at Fenwick, East and West....	1927	459	7	110	.....	64	640	865
Welland 1b—South Pelham Road at Fenwick, South.....	1927	236	3	59	.....	39	337	451
Welland 2a—Crowland Road at Cooks Mills, East and West	1927	681	51	93	.....	13	838	1,393

	1927	485	42	68	8	603	958
Welland 2b—Humberstone Road at Cooks Mills, South.	1925	98	3	14	6	121	154
3-14a—County Road at Lots 39 and 40, Wainfleet Township, at Provincial Highway No. 3	1926	99	2	17	7	125	151
	1927	327	8	23	9	367	540
3-16a—Fonthill Road at Provincial Highway No. 3	1927	346	26	65	15	452	993
3 17a Montrose Road at Lundy's Lane	1925	262	24	58	22	367	425
	1926	122	5	28	8	166	216
	1927	335	27	49	11	423	685
3A 3a Ridgeway Road at Garrison Road	1925	627	239	60	46	995	1,329
	1926	523	213	66	18	847	1,148
3A-3b—Chippewa Road at Garrison Road	1927	608	596	121	13	1,368	1,807
	1925	431	94	41	37	603	645
	1926	300	77	43	12	432	576
	1927	268	117	77	11	474	689
8-1a—Thorold Road at South End Corner	1925	321	112	98	19	551	618
	1926	428	70	127	18	643	1,097
	1927	845	124	202	20	1,191	1,577
8-1b—Portage Road at South End Corner	1925	209	45	84	15	354	401
	1926	434	79	129	11	656	966
	1927	813	163	166	13	1,157	1,681
Niagara Boulevard, near Bridgeburg	1926	301	175	35	4	524	646
	1927	702	1,007	70	2	1,803	3,740
WELLINGTON COUNTY—SUMMER:							
Wellington 1a—Archibald-Foley Sideroad at Alma	1925	19	.....	3	18	40	64
	1926	72	1	9	18	100	141
	1927	Under repair.	.....	.....	.....	.....	.....
Wellington 1b—Elora Road at Alma	1925	360	19	26	91	496	713
	1926	591	29	36	81	737	1,737
	1927	503	19	42	94	658	847
Wellington 1c—Elmira Road at Alma	1925	150	7	10	28	195	287
	1926	208	8	16	20	252	390
	1927	187	3	15	34	239	290
6-9a—Arthur-Orangeville Road at Arthur	1925	101	1	4	72	178	147
	1926	244	3	3	72	322	489
	1927	124	4	11	55	194	238
9-3a—Clifford-Hanover Road at Clifford Village	1925	128	6	14	26	174	242
	1926	136	5	13	28	182	245
	1927	133	4	18	28	183	322
23-2a—Elora Road at Teviotdale	1925	205	10	9	6	230	406
	1926	256	16	12	5	289	491
	1927	287	19	18	10	335	589

COUNTY ROAD TRAFFIC CENSUS—1925, 1926 and 1927—Continued

DAILY AVERAGE

Station and Location of Observer	Year	Ontario	Foreign	Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
WELLINGTON COUNTY—FALL:								
Wellington 1a—Archibald-Foley Sideroad at Alma.....	1925	22	.....	.....	.....	23	45	77
	1926	5	.....	4	.....	1	10	12
	1927	41	.....	4	.....	16	61	82
Wellington 1b—Elora Road at Alma.....	1925	194	4	10	.....	82	290	338
	1926	309	3	25	.....	85	422	537
	1927	354	3	26	.....	85	468	761
Wellington 1c—Elmira Road at Alma.....	1925	78	1	6	.....	29	114	183
	1926	138	1	8	.....	31	178	241
	1927	142	1	10	.....	31	184	299
6-9a—Arthur-Orangeville Road at Arthur.....	1925	32	.....	3	.....	59	94	125
	1926	96	.....	5	.....	81	185	215
	1927	113	1	14	.....	56	184	234
9-3a—Clifford-Hanover Road at Clifford Village.....	1925	71	1	8	.....	41	121	172
	1926	75	1	11	.....	23	110	157
	1927	97	1	10	.....	16	124	217
23-2a—Elora Road at Teviotdale.....	1925	61	1	5	.....	8	75	170
	1926	122	3	7	.....	3	135	232
	1927	126	3	5	1	16	141	252
WENTWORTH COUNTY—SUMMER:								
6-3a—Ohsweken Road at Provincial Highway No. 6.....	1927	21	2	8	.....	14	45	68
6-4a—County Road, Cons. 6 and 7, Glanford Township..	1926	95	1	14	.....	15	125	147
	1927	129	1	40	.....	14	184	216
6-6a—Brock Road at Freelon.....	1925	102	4	15	.....	15	136	162
	1926	131	2	15	.....	19	167	230
	1927	120	5	23	.....	12	160	230
8-5a—Old Stoney Creek Road at Provincial Highway No. 8	1925	147	15	30	1	7	200	290
	1926	259	15	49	.....	12	335	486
	1927	341	42	47	.....	10	440	676
8-7a—Brock Road at Bullock's Corners.....	1925	375	10	62	.....	33	480	582
	1926	326	7	54	.....	37	424	567
	1927	462	17	74	.....	17	570	882

WENTWORTH COUNTY—FALL:

0-3a—Ohsweken Road at Provincial Highway No. 6.....	1927	70	3	10	17	100	255
0-4a—County Road, Cons. 6 and 7, Glanford Township....	1926	70	8	23	23	101	120
	1927	131	1	19	18	173	243
0-6a—Brock Road at Freelon.....	1925	86	1	16	29	134	183
	1926	84	1	25	22	123	163
	1927	126	7	16	11	169	283
8-5a—Old Stoney Creek Road at Provincial Highway No. 8	1925	98	4	38	8	150	176
	1926	196	5	77	17	295	476
8-7a—Brock Road at Bullock's Corners.....	1927	240	17	60	9	326	655
	1925	255	2	59	38	354	429
	1926	404	7	70	36	517	608
	1927	676	13	128	28	845	1,241
YORK COUNTY—SUMMER:							
York 1a—Sutton Road at Sharon.....	1925	965	33	45	27	1,070	1,687
	1926	1,252	22	57	17	1,349	3,236
	1927	1,159	61	131	11	1,362	2,257
York 1b—Mount Albert Road at Sharon.....	1925	134	1	11	12	158	232
	1926	145	1	12	8	166	224
	1927	249	7	29	4	289	526
York 2—Weston Road at Eglinton Avenue.....	1926	3,021	18	716	120	3,880	4,506
	1927	3,423	45	622	80	4,171	4,816
York 3—Vaughan Road at Eglinton Avenue.....	1926	1,775	9	345	77	2,211	2,617
	1927	2,285	23	480	70	2,865	3,632
York 4a—Schomberg Road at Kleinburg, North and South	1927	481	2	152	21	656	986
York 4b—Nashville Road at Kleinburg, West.....	1927	237	1	110	14	362	479
11-40b—Lansing Corner, traffic west of Yonge Street.....	1925	106	2	32	15	155	281
	1926	130	1	14	9	154	230
	1927	175	2	17	14	231	310
11-0c—Lansing Corner, traffic east of Yonge Street.....	1925	311	8	92	23	443	652
	1926	512	6	56	16	590	853
	1927	687	12	83	16	799	1,028
5 1a Dundas Street at Islington.....	1925	1,039	56	208	25	1,404	1,471
	1926	1,545	43	213	18	1,901	2,513
	1927	971	36	122	8	1,186	1,700
2-18a—Markham Road at Danforth Avenue.....	1925	1,260	50	309	69	1,762	2,022
	1926	2,077	66	365	73	2,661	3,629
	1927	1,936	21	320	63	2,417	2,757
2-19a—Old Kingston Road at Danforth Avenue.....	1926	2,618	373	275	12	3,314	4,396
	1927	3,262	469	320	13	4,071	5,776
YORK COUNTY—FALL:							
York 1a—Sutton Road at Sharon.....	1925	288	.....	30	26	344	483
	1926	391	8	57	25	481	781
	1927	582	1	73	14	670	1,454

COUNTY ROAD TRAFFIC CENSUS, 1925, 1926 and 1927 Concluded
DAILY AVERAGE

Station and Location of Observer	Year	Ontario	Foreign	Trucks	Busses	Horse-drawn Vehicles	Total Daily Average	Maximum for One Day
York 1b—Mount Albert Road at Sharon.....	1925	128	.....	10	.....	16	154	249
	1926	100	.....	24	.....	15	139	197
	1927	233	.....	41	.....	11	285	603
York 2—Weston Road at Eglinton Avenue.....	1925	1,744	3	533	44	99	2,423	2,966
	1926	2,420	7	641	.....	111	3,184	3,909
	1927	3,441	14	633	4	88	4,180	6,029
York 3—Vaughan Road at Eglinton Avenue.....	1925	849	1	367	6	118	1,341	2,659
	1926	980	1	299	5	73	1,358	2,001
	1927	1,549	3	354	.....	70	1,976	2,787
York 4a—Schomberg Road at Kleinburg, North and South	1927	526	.....	128	5	29	688	1,385
York 4b—Nashville Road at Kleinburg, West.....	1927	328	.....	62	.....	19	409	574
11-0b—Lansing Corner, traffic west of Yonge Street.....	1925	139	2	42	.....	38	221	457
	1926	157	1	28	.....	20	206	246
	1927	314	1	105	.....	21	439	807
11-0c—Lansing Corner, traffic east of Yonge Street.....	1925	531	1	166	.....	38	736	1,646
	1926	329	2	94	1	36	462	583
	1927	822	3	192	1	19	1,037	1,979
5-1a—Dundas Street at Islington.....	1925	755	7	189	94	28	1,073	1,301
	1926	795	22	191	66	13	1,087	1,546
	1927	Under construction.			.....	.....	.....	.....
2-18a—Markham Road at Danforth Avenue.....	1925	2,391	55	621	40	247	3,354	4,168
	1926	2,647	13	585	179	277	3,699	5,068
	1927	1,903	6	345	76	54	2,384	5,336
2-19a—Old Kingston Road at Danforth Avenue.....	1925	1,499	30	267	21	19	1,836	2,075
	1926	1,496	58	244	27	18	1,843	2,757
	1927	2,373	142	291	5	17	2,828	5,332

Report of Motor Vehicles Branch, 1926

By J. P. Bickell, Registrar of Motor Vehicles

Registrations

The registration of motor vehicles during the year 1926 showed considerable increase over that of 1925. The passenger cars registered numbered 343,992. The commercial vehicles numbered 39,012. Detailed statistics of these registrations arranged according to counties, occupations of owners, etc., etc., are appended hereto.

Issuers of Motor Vehicle Permits

During the year the Department had ninety agents appointed throughout the Province to issue motor vehicle permits. These agents collected a total of \$4,884,969.18 and the commission deducted by them for their services amounted to \$78,065.35.

Suspension or Cancellation of Motor Vehicle Permits

Two hundred and sixty-seven persons convicted of operating motor vehicles or of being in charge of motor vehicles while intoxicated were prohibited from operating for periods varying from one to three months. In cases where the persons convicted were the owners of the vehicles, their motor vehicle permits were also suspended for like periods. These suspensions were in addition to gaol sentences provided under the Criminal Code. One hundred and sixty-seven motor vehicle permits were suspended by Police Magistrates for the offence of "Reckless Driving."

Chauffeur Examiners

During the year, 125 examiners of applicants for chauffeur licenses were appointed throughout the Province. These examiners examined and passed 10,467 applicants for chauffeur licenses.

Traffic Officers

In 1926 approximately 1,500 miles of Provincial Highways were patrolled by forty-three officers comprising our Highway Traffic Officers Staff. The system of warning motorists, rather than prosecuting, was used very extensively and a marked decrease in the number of offences committed on most of the details was noticed. Special attention was given to elimination of glaring headlights and the use of but one light—which offences constituted two of the greatest menaces.

Public Vehicles

The work of licensing and regulating the public passenger vehicle has largely increased this year. Although the number of licensed operators does not indicate this, it is shown in the total of vehicles operated. Routes have been extended, and a service was given over 3,100 miles of Provincial and other highways.

Considerable improvement in the efficiency of the services operated has been evident. Through services have been established and by the co-operation of the individual operators, connections between the various companies have been improved which has brought with it a big increase in the number of passengers carried.

Several of the original small operators have discontinued, as their routes have been acquired by larger companies.

The spirit of co-operation between the Department and the licensed operator in the matter of time-tables and tariff of tolls, has been continued and general appreciation of the value of the regulations has been shown.

During 1926 it was not found necessary to make any important alterations in the regulations. The policy of the Department originally adopted has been followed throughout the year, and applications for duplication of service have not been favoured. Any demand for additional service has been met by the operator already licensed upon the request of the Department.

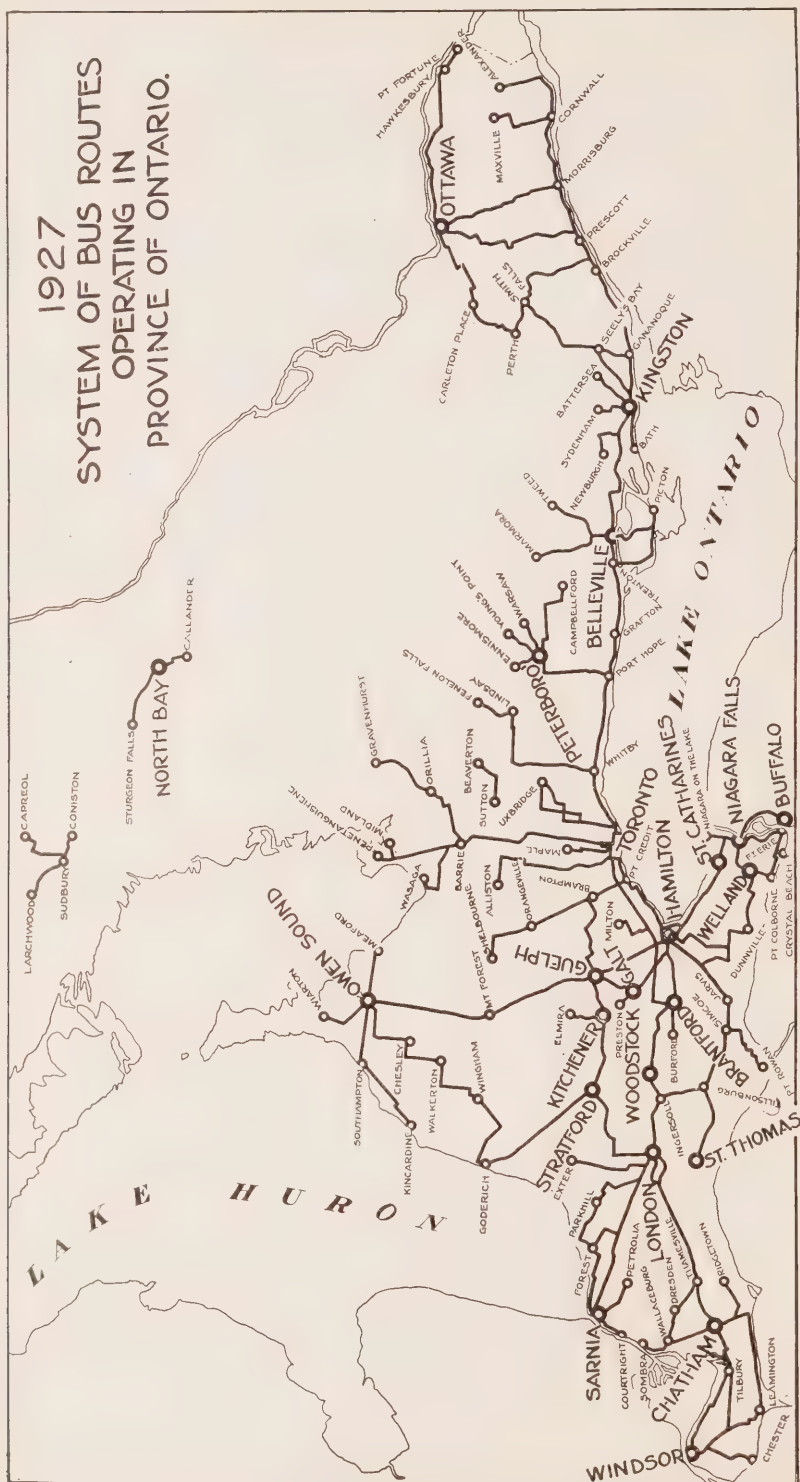
Apart from the regular services operated, there has been a growing demand from the public for sight-seeing and chartered trips. This part of the business is distinct from the regular scheduled service and is being conducted exclusively in some cases by operators who are not licensed. Legislation to control such operation is now in hand and will be effective at an early date.

An association has been formed by the licensed operators this year and the relations between this body and the Department have been one of complete co-operation. Expressions of satisfaction have been forwarded by them to the Department as to the Provisions of the Public Vehicle Act since its enforcement, although there is the claim made that the fees charged are too high since the gas tax was added in May, 1925.

Eastern Conference

The Registrar of Motor Vehicles attended most of the regular meetings of the Conference, which is composed of representatives from the Eastern States and the Provinces of Ontario and Quebec. Much information was secured as a result of attendance at these meetings, which was of value in the administration of the Motor Vehicles Branch.

1927
SYSTEM OF BUS ROUTES
OPERATING IN
PROVINCE OF ONTARIO.



MOTOR VEHICLES BRANCH, HIGHWAYS DEPARTMENT

Revenue for the Fiscal Year 1925-1926

Automobile permits.....	\$5,032,427 85	
Commercial permits.....	1,079,656 03	
Trailer permits.....	11,002 23	
Motorcycle permits.....	13,035 45	
Automobile dealers' permits.....	47,923 66	
Commercial dealers' permits.....	4,035 50	
Motorcycle dealers' permits.....	60 00	
Chauffeurs.....	47,716 92	
Duplicate cards and badges.....	629 50	
Non-professional certificates.....	214 32	
Transfers.....	89,017 56	
In transits.....	12,461 50	
Garages.....	21,444 25	
Searches and certificates.....	19 50	
Telephone commission.....	13 69	
Incomplete applications.....	81 50	
Miscellaneous.....	38 00	
Lists.....	4,178 85	
Fines.....	44,562 70	
Public vehicles.....	87,085 26	
		\$6,495,604 27
LESS:—		
Commissions deducted by agents.....	\$78,065 35	
Express charges paid by agents.....	88 23	
Cheques charged by Provincial Treasurer.....	217 00	
Balance due by agents.....	170 87	
Refunds deducted by Provincial Treasurer.....	1,349 77	
		79,891 22
		\$6,415,713 05

SUMMARY OF CONVICTIONS REGISTERED UNDER THE HIGHWAY TRAFFIC ACT AS REPORTED BY POLICE MAGISTRATES 1926 (Calendar Year)

Section Violated	Offence	Number of Convictions
1. 5	No registration plates.....	246
2. 6	Defaced registration plates.....	111
3. 7 (1)	Improper registration plates.....	35
4. 7 (3)	Dirty registration plates.....	68
5. 10 (1)	No lights.....	1,234
6. 10 (2)	Too many lights of over 4 c.p.....	45
7. 10 (7)	No rear lights.....	44
8. 10 (13)	Revolving lights.....	4
9. 12	Trucks without mirrors.....	37
10. 14	Unnecessary noise.....	54
11. 17	No chauffeur license.....	60
12. 22	No garage license.....	3
13. 24	Exceeding speed limit.....	16,381
14. 25	Reckless driving.....	2,355
15. 26	Racing.....	11
16. 27	Speeding (heavy trucks).....	16
17. 32	Excess load in March and April.....	291
18. 38 (1)	Passing standing street car.....	486
19. 38 (2)	Passing street car on wrong side.....	63
20. 41	Failure to return to scene of accident.....	85
21. 44	Operating while under age.....	61
22. 45	Persons hiring vehicles without license.....	6
23. 46	Driving while intoxicated.....	277
24. Miscellaneous.....		218

Total fines, \$165,501.00. Total costs, \$47,201.64. Total convictions, 22,197.

NOTE.—Fines imposed for offences committed on other than Provincial Highways are paid to the municipality in which the offence is committed.

PASSENGER CARS REGISTERED—1926

Counties		Cities		Total
Algoma.....	1,684	Sault Ste. Marie.....	2,232	3,916
Brant.....	2,636	Brantford.....	2,825	5,461
Bruce.....	5,408	.....	.....	5,408
Carleton.....	3,448	Ottawa.....	8,702	12,150
Dufferin.....	2,358	.....	.....	2,358
Dundas.....	2,162	.....	.....	2,162
Durham.....	2,812	.....	.....	2,812
Elgin.....	4,508	St. Thomas.....	2,251	6,759
Essex.....	12,097	Windsor.....	7,793	19,890
Frontenac.....	2,290	Kingston.....	2,127	4,417
Glengarry.....	1,340	.....	.....	1,340
Grenville.....	1,796	.....	.....	1,796
Grey.....	5,667	Owen Sound.....	1,290	6,957
Haldimand.....	3,769	.....	.....	3,769
Haliburton.....	440	.....	.....	440
Halton.....	3,208	.....	.....	3,208
Hastings.....	5,472	Belleville.....	1,605	7,077
Huron.....	6,330	.....	.....	6,330
Kenora.....	476	.....	.....	476
Kent.....	7,496	Chatham.....	2,144	9,640
Lambton.....	5,992	Sarnia.....	2,294	8,286
Lanark.....	3,100	.....	.....	3,100
Leeds.....	4,061	.....	.....	4,061
Lennox and Addington.....	2,312	.....	.....	2,312
Lincoln.....	3,297	St. Catharines.....	2,653	5,950
Manitoulin.....	537	.....	.....	537
Middlesex.....	7,263	London.....	7,740	15,003
Muskoka.....	1,659	.....	.....	1,659
Nipissing.....	1,685	North Bay.....	1,250	2,935
Norfolk.....	3,781	.....	.....	3,781
Northumberland.....	3,870	.....	.....	3,870
Ontario.....	4,132	Oshawa.....	2,158	6,290
Oxford.....	5,607	Woodstock.....	1,131	6,738
Parry Sound.....	1,883	.....	.....	1,883
Peel.....	3,521	.....	.....	3,521
Perth.....	4,701	Stratford.....	1,927	6,628
Peterboro.....	2,682	Peterboro.....	2,114	4,796
Prescott.....	1,458	.....	.....	1,458
Prince Edward.....	2,569	.....	.....	2,569
Rainy River.....	1,122	.....	.....	1,122
Renfrew.....	3,641	.....	.....	3,641
Russell.....	1,114	.....	.....	1,114
Simcoe.....	9,315	.....	.....	9,315
Stormont.....	2,434	.....	.....	2,434
Sudbury.....	1,588	.....	.....	1,588
Thunder Bay.....	715	Fort William.....	1,757	.....
.....	.....	Port Arthur.....	1,537	4,009
Temiskaming.....	2,851	.....	.....	2,851
Victoria.....	3,674	.....	.....	3,674
Waterloo.....	5,514	Galt.....	1,391	.....
.....	.....	Kitchener.....	2,938	9,843
Welland.....	6,295	Niagara Falls.....	2,727	.....
.....	.....	Welland.....	1,587	10,609
Wellington.....	4,223	Guelph.....	2,057	6,280
Wentworth.....	4,423	Hamilton.....	13,608	18,031
York.....	13,491	Toronto.....	63,841	77,332
Foreign.....	406	.....	.....	406
	200,313		143,679	343,992

IMPROVEMENT IN ONTARIO FOR 1926 AND 1927

191

Horse Power

4-cylinder less than 25 horse-power	281,264	
4-cylinder more than 25 and up to 35 horse-power.....	2,501	
4-cylinder more than 35 and up to 50 horse-power.....	14	
		283,779
6-cylinder less than 25 horse-power.....	26,611	
6-cylinder more than 25 and up to 35 horse-power.....	29,262	
6-cylinder more than 35 and up to 50 horse-power.....	1,810	
6-cylinder more than 50 horse-power.....	141	
		57,824
8-12-cylinder more than 25 and up to 35 horse-power.....	1	
8-12-cylinder more than 35 and up to 50 horse-power.....	1,963	
8-12-cylinder more than 50 horse-power.....	365	
		2,329
Electric.....		60
		343,992

Models

Opened cars.....	210,118
Closed cars.....	133,874

Registrations

Originals.....	57,935
Renewals.....	286,057

Occupations

Farmers.....	99,649	
Merchants.....	27,016	
Professional.....	20,346	
Liveries and Garages.....	4,810	
Salesmen, Travellers, etc.....	21,043	
Manufacturers.....	7,100	
Tradesmen.....	49,446	
Managers.....	18,281	
Unclassified.....	59,948	
Unoccupied.....	35,418	
Municipal.....	409	
Dominion Government.....	115	
Ontario Government.....	411	
		343,992

COMMERCIAL CARS REGISTERED—1926

Counties		Cities		Total
Algoma.....	136	Sault Ste. Marie.....	175	311
Brant.....	192	Brantford.....	439	631
Bruce.....	415			415
Carleton.....	325	Ottawa.....	1,345	1,670
Dufferin.....	131			131
Dundas.....	130			130
Durham.....	196			196
Elgin.....	305	St. Thomas.....	204	509
Essex.....	1,642	Windsor.....	1,350	2,992
Frontenac.....	154	Kingston.....	276	430
Glenarry.....	65			65
Grenville.....	160			160
Grey.....	243	Owen Sound.....	133	376
Haldimand.....	261			261
Haliburton.....	151			151
Halton.....	303			303
Hastings.....	354	Belleville.....	220	574
Huron.....	311			311
Kenora.....	104			104
Kent.....	547	Chatham.....	345	892
Lambton.....	393	Sarnia.....	210	603
Lanark.....	181			181
Leeds.....	312			312
Lennox and Addington.....	169			169
Lincoln.....	587	St. Catharines.....	446	1,033
Manitoulin.....	32			32

COMMERCIAL CARS REGISTERED—1926—*Continued.*

Counties		Cities		Total
Middlesex.....	542	London.....	1,099	1,641
Muskoka.....	156			156
Nipissing.....	99	North Bay.....	109	208
Norfolk.....	397			397
Northumberland.....	375			375
Ontario.....	311	Oshawa.....	251	562
Oxford.....	486	Woodstock.....	165	651
Parry Sound.....	142			142
Peel.....	575			575
Perth.....	241	Stratford.....	174	415
Peterboro.....	148	Peterboro.....	247	395
Prescott.....	168			168
Prince Edward.....	187			187
Rainy River.....	94			94
Renfrew.....	236			236
Russell.....	96			96
Simcoe.....	527			527
Stormont.....	179			179
Sudbury.....	221			221
Thunder Bay.....	109	Fort William.....	271	
		Port Arthur.....	191	571
Temiskaming.....	358			348
Victoria.....	222			222
Waterloo.....	414	Galt.....	179	
		Kitchener.....	322	915
Welland.....	677	Niagara Falls.....	413	
		Welland.....	221	1,311
Wellington.....	248	Guelph.....	225	473
Wentworth.....	850	Hamilton.....	1,964	2,814
York.....	1,880	Toronto.....	9,890	11,770
Foreign.....	411			411
	18,148		20,864	39,012

Tires

Pneumatic.....	32,583	
Solid.....	5,666	
Municipal.....	367	
Ontario Government }.....	396	
Dominion Government }		39,012

Gross Weights—Pneumatic Tires

Less than two tons.....	13,259	
Of two tons and up to three tons.....	15,545	
More than three tons and up to four tons.....	2,061	
More than four tons and up to five tons.....	920	
More than five tons and up to six tons.....	386	
More than six tons and up to seven tons.....	189	
More than seven tons and up to eight tons.....	137	
More than eight tons and up to nine tons.....	71	
More than nine tons and up to ten tons.....	15	
	32,583	

Gross Weights—Solid Tires

Less than two tons.....	198	
Of two tons and up to three tons.....	1,994	
More than three tons and up to four tons.....	312	
More than four tons and up to five tons.....	461	
More than five tons and up to six tons.....	662	
More than six tons and up to seven tons.....	514	
More than seven tons and up to eight tons.....	685	
More than eight tons and up to nine tons.....	380	
More than nine tons and up to ten tons.....	174	
More than ten tons and up to eleven tons.....	85	
More than eleven tons and up to twelve tons.....	201	
	5,666	
Municipal.....	367	
Ontario Government }.....	396	
Dominion Government }		763
		39,012

Occupations

Farmers.....	5,780
Merchants.....	11,574
Busses.....	665
Cartage and express less than three tons gross.....	2,433
Cartage and express more than three tons gross.....	1,879
Manufacturers.....	4,068
Tradesmen.....	4,032
Contractors, three tons gross or less.....	1,130
Contractors, more than three tons gross.....	732
Unclassified.....	5,163
Municipal.....	1,060
Dominion Government.....	183
Ontario Government.....	313

39,012

TRAILER REGISTRATIONS—1926

Counties		Cities	Total
Algoma.....	2	Sault Ste. Marie.....	2
Brant.....	7	Brantford.....	24
Bruce.....	5	.....	5
Carleton.....	4	Ottawa.....	22
Dufferin.....	.....	.....	.....
Dundas.....	3	.....	3
Durham.....	6	.....	6
Elgin.....	23	St. Thomas.....	3
Essex.....	87	Windsor.....	21
Frontenac.....	1	Kingston.....	7
Glenarry.....	.....	.....	8
Grenville.....	2	.....	2
Grey.....	2	Owen Sound.....	4
Haldimand.....	27	.....	6
Haliburton.....	.....	.....	27
Halton.....	12	.....	.....
Hastings.....	8	Belleville.....	11
Huron.....	63	.....	19
Kenora.....	1	.....	63
Kent.....	39	Chatham.....	14
Lambton.....	20	Sarnia.....	13
Lanark.....	13	.....	33
Leeds.....	11	.....	13
Lennox and Addington.....	12	.....	11
Lincoln.....	5	St. Catharines.....	14
Manitoulin.....	.....	.....	12
Middlesex.....	39	London.....	27
Muskoka.....	2	.....	66
Nipissing.....	.....	North Bay.....	2
Norfolk.....	17	.....	2
Northumberland.....	15	.....	17
Ontario.....	13	Oshawa.....	25
Oxford.....	25	Woodstock.....	4
Parry Sound.....	1	.....	29
Peel.....	13	.....	1
Perth.....	20	Stratford.....	8
Peterboro.....	.....	Peterboro.....	9
Prescott.....	.....	.....	9
Prince Edward.....	4	.....	.....
Rainy River.....	1	.....	4
Renfrew.....	4	.....	1
Russell.....	.....	.....	4
Simcoe.....	9	.....	.....
Stormont.....	5	.....	9
Sudbury.....	3	.....	5
Thunder Bay.....	3	Fort William.....	3
.....	Port Arthur.....	6
Temiskaming.....
Victoria.....	5
Waterloo.....	14	Galt.....	3
.....	Kitchener.....	10

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TRAILER REGISTRATIONS—1926—*Continued.*

Counties		Cities		Total
Welland.....	10	Niagara Falls.....	6
Wellington.....	6	Welland.....	10	26
Wentworth.....	14	Guelph.....	6	12
York.....	33	Hamilton.....	118	132
Foreign.....	13	Toronto.....	417	450
		.....	....	13
	622		776	1,398

Trailer Gross Weights

One ton or less.....	858
More than one ton and up to two tons.....	136
More than two tons and up to three tons.....	95
More than three tons and up to four tons.....	77
More than four tons and up to five tons.....	77
More than five tons and up to six tons.....	19
More than six tons and up to seven tons.....	14
More than seven tons and up to eight tons.....	15
More than eight tons and up to nine tons.....	8
More than nine tons and up to ten tons.....	10
Municipal.....	83
Ontario Government }	6
Dominion Government }	

1,398

MOTORCYCLE REGISTRATIONS—1926

Counties		Cities		Total
Algoma.....	14	Sault Ste. Marie.....	24	38
Brant.....	17	Brantford.....	34	51
Bruce.....	11	.....	....	11
Carleton.....	20	Ottawa.....	140	160
Dufferin.....	10	.....	....	10
Dundas.....	14	.....	....	14
Durham.....	19	.....	....	19
Elgin.....	11	St. Thomas.....	9	20
Essex.....	38	Windsor.....	41	79
Frontenac.....	6	Kingston.....	29	35
Glengarry.....	5	.....	....	5
Grenville.....	7	.....	....	7
Grey.....	13	Owen Sound.....	9	22
Haldimand.....	10	.....	....	10
Haliburton.....	5	.....	....	5
Halton.....	30	.....	....	30
Hastings.....	13	Belleville.....	11	24
Huron.....	14	.....	....	14
Kenora.....	2	.....	....	2
Kent.....	18	Chatham.....	8	26
Lambton.....	12	Sarnia.....	2	14
Lanark.....	9	.....	....	9
Leeds.....	13	.....	....	13
Lennox and Addington.....	9	.....	....	9
Lincoln.....	33	St. Catharines.....	25	58
Manitoulin.....	.....	.....	....	....
Middlesex.....	16	London.....	80	96
Muskoka.....	6	.....	....	6
Nipissing.....	11	North Bay.....	11	22
Norfolk.....	19	.....	....	19
Northumberland.....	9	.....	....	9
Ontario.....	31	Oshawa.....	38	69
Oxford.....	25	Woodstock.....	15	40
Parry Sound.....	4	.....	....	4
Peel.....	21	.....	....	21
Perth.....	25	Stratford.....	9	34
Peterboro.....	3	Peterboro.....	43	46
Prescott.....	5	.....	....	5
Prince Edward.....	16	.....	....	16
Rainy River.....	3	.....	....	3
Renfrew.....	20	.....	....	20

MOTORCYCLE REGISTRATIONS—1926—*Continued.*

Counties		Cities		Total
Russell.....	17	.....		17
Simcoe.....	45	.....		45
Stormont.....	9	.....		9
Sudbury.....	.....	.....		.....
Thunder Bay.....	3	Fort William.....	17	.....
.....	.....	Port Arthur.....	14	34
Temiskaming.....	16	.....		16
Victoria.....	10	.....		10
Waterloo.....	46	Galt.....	26	.....
.....	.....	Kitchener.....	35	107
Welland.....	48	Niagara Falls.....	38	.....
.....	.....	Welland.....	23	109
Wellington.....	8	Guelph.....	22	30
Wentworth.....	40	Hamilton.....	127	167
York.....	248	Toronto.....	1,454	1,702
Foreign.....	4	.....		4
	1,061		2,284	3,345

Motorcycle Registrations—1926

Original.....	449
Renewal.....	2,896
	3,345

Chauffeur Registrations—1926

Original.....	10,479
Renewal.....	29,034
	39,513

REPORT OF MOTOR VEHICLES BRANCH, 1927
By J. P. BICKELL, Registrar of Motor Vehicles

This report shows in detail—(1) the motor vehicle registrations for the Province for the years 1904 to 1927, inclusive; (2) the motor vehicle registrations for the calendar year of 1927 arranged according to the residence of the owner and according to model, horse-power and number of cylinders of passenger cars, and the gross weight and type of tires of commercial vehicles; (3) a financial statement for the fiscal year which has been duly verified for accuracy by the Provincial Auditor; (4) a statement showing the revenue collected for motor vehicle permits, etc., from 1904 to 1927, inclusive; and (5) a summary of the convictions registered under The Highway Traffic Act as reported to the Branch by Police Magistrates during the calendar year.

(1) Registrations

The registration of all types of vehicles, as shown in the tables hereto attached, with the exception of motorcycles, increased in 1927 over 1926 notwithstanding the fact that the lowest-priced light car was off the market for most of the year.

(2) Suspensions and Revocations of Permits and Licenses

Police Magistrates are authorized to suspend permits and licenses for periods not exceeding six months for certain offences. The Minister, under section 46, is required to suspend the permit and license of anyone convicted of the offence of driving or being in charge of a motor vehicle while intoxicated, and under section 21 is empowered to suspend or revoke for any reason which he may deem sufficient. Suspensions following convictions, on a charge of "Reckless Driving," numbered 409. Those convicted of being intoxicated while operating, or being in charge of a motor vehicle while intoxicated, numbered 380. Other offences for which permits were suspended, numbered 44.

(3) Revenue

It will be noted that the revenue of the Branch shows a decrease from that of the fiscal year 1925-26. This is accounted for by a reduction of \$5.00 in the fees charged for the registration of passenger cars, which reduction became effective on the first of January, 1927. A new item of revenue appears in the financial statement for the year, that of operators' licenses. The revenue from this source amounted to \$444,476.88. The revenue from Chauffeur licenses shows a remarkable increase, being \$85,056.52, or \$37,339.60 more than collected in 1926.

The bringing into effect of the operators' license law on July 1st, resulted in a more rigid enforcement of that section of the Act requiring chauffeur licenses.

The revenue from transfers increased from \$89,017.36 in 1926, to \$131,334.43 in 1927. While there were no doubt many more sales of used cars in 1927, and consequently more transfers, the adoption of a new system of transferring permits is responsible for much of this increase in revenue. Under this new system, which has the approval of Council and is outlined in the regulations, the transfer fee of \$2.00 must accompany the application and same must be made on the form prescribed on the back of the permit card. The Public Vehicle fees also show a decided INCREASE, reaching a total of \$119,319.16.

(4) Highway Traffic Officers

The policing of the Provincial Highways by our force of Highway Traffic Officers was on account of the enormous increase in tourists from the United States, a problem which required considerable attention during the year. The Force was increased and brought up to a strength of seventy men. These Officers patrolling our highways on motorcycles were, I believe, very effective in preventing "Reckless Driving" and making our highways safe for all users. The policy of warning, rather than summoning, for minor offences, was continued.

It is with regret that I record the accidental death of three officers, Messrs. McGillivray, McKay and O'Callaghan. These officers, while pursuing their regular duties, met with accidents which resulted in their almost instantaneous deaths. Accidents to our officers were more numerous this year than in any previous year, and several were confined to hospitals with broken limbs.

(5) Public Vehicles

The licensing and regulating of the Public Vehicles, pursuant to the provisions of The Public Vehicles Act, has progressed favourably. The relations between the operators and the Department have continued to be one of complete co-operation. The type of vehicle and service being given has shown a decided improvement during the year.

A significant point in this branch of our work is shown by the fact that while in 1926 the number of operators totalled 107, and the number of vehicles totalled 384, in 1927 the number of operators licensed decreased to 103, while the number of vehicles increased to 480. This is accounted for by the amalgamation of one or two lines and the purchase by one of the largest corporations of the equipment and operating rights of several small operators.

(6) Public Commercial Vehicle Act

This Act, passed at the last session of the Legislature, has not yet been brought into effect. The Department is studying the situation insofar as motor truck operation is concerned. It would appear that the business of freight transportation by common carrier truck is in a stage of development which would seem to warrant a further delay in the enforcement of this Act designed to regulate such operations.

(7) Operators' Licenses

Part XII of the Highway Traffic Act was brought into effect by order of the Lieutenant-Governor-in-Council on the 1st day of July, 1927. This part of the Act requires that every operator of a motor vehicle, other than one holding a chauffeur license, shall secure a motor vehicle operator's license. The regulations passed pursuant to the Act provided that applicants who had driven for a period of six months and for a distance of 500 miles and had no physical or mental defects, could secure licenses without examination if applications were made before the 30th of November, 1927. Those who had not driven the required length of time and mileage, or had any physical or mental disability or disease, were examined before being licensed. These examinations disclosed the fact that many hundreds of disabled persons were operating motor vehicles. Licenses were refused to persons subject to epileptic fits, and persons who were disabled by the loss of a limb were restricted to the operation of a vehicle specially equipped to compensate for their disability, viz., a person having the use of but one leg was granted a license to operate a car only if equipped with a device which permitted the foot brake and clutch pedals to be operated simultaneously with one foot.

Applicants whose eyesight was defective to a point which, according to the Examiner and a registered Optometrist, prevented the proper operation of a motor vehicle, were refused licenses.

In all, 444,476 operators' licenses and 60,951 chauffeur licenses were issued during the year. This total of 505,427 licenses to drive indicates, I believe, that but few persons are operating without licenses. The total vehicles (passenger cars, commercial vehicles and motorcycles) registered in 1927, was 433,504.

Contrary to popular belief there are not in my opinion an average of two drivers for each vehicle. This fact is borne out by reference to other jurisdictions where operators' license laws are in effect.

(8) Lights on all Vehicles

On the first of October, 1927, an amendment to our Highway Traffic Act, requiring a light to be displayed on every vehicle on the highway, became effective. The only exceptions to this law are bicycles, tricycles, and certain horse-drawn vehicles, which are not structurally suited for carrying lighted lamps, and vehicles commonly used for conveying inflammable materials. Bicycles and tricycles are required to carry a red reflector on the rear, and the Department is permitted to make regulations respecting the display of reflectors on the other vehicles; also to approve of the reflectors to be used. The Regulations of the Department respecting the use of reflectors read as follows:—

Reflectors named in Schedule "A" hereto, may be displayed in lieu of lighted lamps on vehicles hereinafter specified, subject to the following restrictions:

1. Horse-drawn vehicles commonly used for conveying inflammable materials such as hay, straw, loose fodder and the like, or for conveying inflammable, explosive or highly volatile substances, such as coal oil, gasoline and the like, and horse-drawn vehicles commonly used without a box, body or container or otherwise structurally unsuitable for carrying lighted lamps when operated on any highway may have an approved reflector displayed thereon, and when such reflector is so displayed, a lighted lamp shall not be required to be displayed on such vehicles. Such reflector shall be attached to the left side of the vehicle, and shall reflect white to the front and red to the rear, or if owing to the construction of the vehicle, or the nature of the load carried thereon, it is not practicable to display the reflector on the side, then one reflector, reflecting red, shall be displayed on the rear, and one reflecting white shall be displayed on the front.

2. Trailers commonly used for conveying inflammable explosive or highly volatile substances such as coal oil, gasoline and the like, when operated on any highway may have an approved reflector displayed on the left side at the rear-end thereof, reflecting white to the front and red to the rear, and when such reflector is so displayed a lighted lamp shall not be required to be displayed on such trailer.

3. Reflectors displayed pursuant to these regulations shall be so attached that the reflecting surfaces are not obstructed by any portion of the vehicle, horses, trailer, or load, and are clearly visible to vehicles approaching from the front and rear respectively.

4. Nothing in these regulations shall affect the duties and liabilities of persons operating vehicles with overhanging loads as provided in section 34 of the Highway Traffic Act.

SCHEDULE "A"

Type and Name of Reflector	Maker of Reflector	Description and Specifications
Stimsonite Reflector.....	Stimson Reflector Co.,.....	Minimum size of reflecting surface twelve square inches.
Persons Vehicle Reflector..	Persons Majestic Manufacturing Co., Worcester, Mass.	Reflectors to correspond with samples on deposit in the Office of the Registrar of Motor Vehicles.

The value of a light or reflective signal on a horse-drawn vehicle cannot be disputed in these days of heavy vehicular traffic. One is inviting trouble to operate without such a signal, and long before the law became operative many farmers were displaying lights as a protective measure. There has been little or no opposition to this law. Drivers of horse-drawn vehicles have been quick to realize that it was designed to protect them and there has been a fairly general observance of the regulations. Accidents between motor vehicles and horse-drawn vehicles have been practically eliminated. The drivers of both classes of vehicles have, by the bringing into effect of this law, removed one of the worst hazards of night driving.

(9) Safety Campaign

During the month of October an intensive campaign to promote greater care in the use of motor vehicles on our highways was carried on. This Campaign sponsored, of course, by the Department, was executed by "The Highway Safety Committee," with the Hon. Mr. Henry as chairman. The members of the Executive of this Committee were Chairman, Hon. Geo. S. Henry; W. G. Robertson, Sec.-Treas. of the Ontario Motor League; Chief of Police Dickson, Toronto; J. F. H. Wyse, Manager of the Ontario Safety League; Thos. Marshall, Secretary of the Associated Boards of Trade; R. M. Smith, Deputy Minister of Highways; and the Registrar of Motor Vehicles, who acted as Secretary and Manager of the Campaign.

The Committee, by means of its first campaign of education, instruction, and a strict enforcement of the traffic laws, endeavoured to impress upon motorists and pedestrians the fact that most accidents are preventable, and that by the exercise of care, courtesy, and common sense, the street and highway fatalities can, and must be, reduced.

The campaign included newspaper advertising, posters, billboard displays, radio talks, motion picture slides, circular letters, and speakers for service club luncheons, etc. The newspaper advertising was directed to pedestrians—particularly to children, as well as to motorists. Garage operators were urged to install equipment for testing and adjusting headlights and brakes. They responded surprisingly well, and motorists by the thousands had these two essential parts of their vehicles put into good condition.

The Executive Committee received the wholehearted co-operation of the members of the Advisory Committee, which was composed of all editors, heads of Municipal Governments, Police Chiefs, Presidents of Boards of Trade, Automobile Clubs and Service Clubs. Particular mention should, I believe, be made to the efforts put forth on behalf of the Campaign by the Press and the Motor Clubs.

It is difficult to measure the success of a campaign of this nature, but one can state, without fear of contradiction, that night-driving conditions have improved as a result of the attention given to headlights, and from all parts of the Province I am advised that there is greater care, courtesy, and common sense being exercised by the users of our highways.

The statements referred to in the first paragraph are appended hereto.

MOTOR VEHICLE REGISTRATIONS FOR THE YEARS 1904-1927 INCLUSIVE

Year	Passen- ger cars	Owned in Ontario	Others	Com- mercial Vehicles	Motor- cycles	Public Vehicles		Chauf- feur
						Vehicles	Oper.	
1904.....	535							
1905.....	553							
1906.....	1,176	517	659					
1907.....	1,530	550	980					
1908.....	1,754	589	1,165					
1909.....	2,452	1,020	1,432					
1910.....	4,230	1,977	2,253					
1911.....	11,339	7,338	4,001					
1912.....	16,268	11,939	4,327		1,754			2,965
1913.....	23,700	17,750	5,950		2,900			3,514
1914.....	31,724	25,308	6,416		3,633			3,773
1915.....	42,346	36,661	5,685		4,174			5,322
1916.....	51,589	50,587	1,002	2,786	4,287			5,966
1917.....	78,861	78,475	386	4,929	5,180			8,214
1918.....	101,845	101,599	246	7,529	5,002			10,629
1919.....	127,860	127,512	348	11,428	5,516			15,400
1920.....	155,861	155,519	342	16,204	5,496			19,563
1921.....	181,978	181,686	292	19,554	4,989			21,808
1922.....	210,333	210,008	325	24,164	4,799			25,301
1923.....	245,815	245,435	380	28,612	4,325			27,033
1924.....	271,341	270,876	465	31,488	3,941	50	102	29,676
1925.....	303,736	303,216	520	34,690	3,748	91	216	33,740
1926.....	343,992	343,586	406	39,012	3,345	107	384	39,513
1927.....	386,903			43,442	3,159	103	480	64,916

MOTOR VEHICLES BRANCH

Highways Department

Revenue for the Fiscal Year 1926-1927

Automobile permits.....	\$3,836,415 33	
Commercial permits.....	1,308,553 88	
Trailer permits.....	16,781 34	
Motorcycle permits.....	12,094 80	
Automobile dealers permits.....	50,660 21	
Commercial dealers permits.....	4,315 02	
Motorcycle dealers permits.....	89 05	
Operators.....	444,476 88	
Chauffeurs.....	85,056 52	
Duplicate cards and badges.....	2,674 65	
Non-professional certificates.....	121 00	
Transfers.....	131,354 43	
In transits.....	14,402 50	
Garages.....	22,750 42	
Certificates.....	21 75	
Telephone commission.....	17 20	
Incomplete applications.....	94 50	
Miscellaneous.....	95 00	
Lists.....	1,869 42	
Fines.....	47,729 62	
Public vehicles.....	119,319 16	
Less		\$6,098,892 68
Commissions deducted by agents.....	\$130,763 00	
Express charges paid by agents.....	55 39	
Cheques charged back by Provincial Treasurer..	1,097 88	
Balance due by agents.....	415 78	
Refunds deducted by Provincial Treasurer.....	1,697 00	

134,029 05

\$5,964,863 63

Statement of Revenue collected during the fiscal years 1904-1927, inclusive

Year	Receipts
1904.....	\$1,680 00
1905.....	1,142 00
1906.....	5,523 15
1907.....	8,098 50
1908.....	10,007 75
1909.....	12,418 75
1910.....	24,394 01
1911.....	50,831 22
1912.....	73,255 96
1913.....	105,558 95
1914.....	149,210 45
1915.....	334,759 78
1916.....	639,987 09
1917.....	930,753 00
1918.....	1,214,093 87
1919.....	1,580,146 61
1920.....	1,990,833 38
1921.....	2,945,360 36
1922.....	3,477,430 13
1923.....	4,296,009 32
1924.....	4,784,697 13
1925.....	5,638,993 45
1926.....	6,415,713 05
1927.....	5,964,863 63

SUMMARY OF CONVICTIONS REGISTERED UNDER THE HIGHWAY TRAFFIC ACT
1927 (CALENDAR YEAR)

Section violated	Offence	Number of convictions
1. 5	No registration plates.....	349
2. 6	Defaced registration plates.....	231
3. 7 (1)	Improper registration plates.....	115
4. 7 (3)	Dirty registration plates.....	126
5. 10 (1)	No lights.....	2,207
6. 10 (2)	Too many lights of over 4 c.p.....	22
7. 10 (7)	No rear lights.....	54
8. 10 (13)	Revolving light.....	3
9. 12	Trucks without mirrors.....	158
10. 14	Unnecessary noise.....	48
11. 17	No chauffeur license.....	70
12. 22	No garage license.....	5
13. 24	Exceeding speed limit.....	17,205
14. 25	Reckless driving.....	3,280
15. 26	Racing.....	4
16. 27	Speeding (heavy trucks).....	.....
17. 32	Excess load in March and April.....	.....
18. 38 (1)	Passing standing street car.....	489
19. 38 (2)	Passing street car on wrong side.....	53
20. 41	Failure to return to scene of accident.....	131
21. 44	Operating while under age.....	77
22. 45	Persons hiring vehicles without license.....	.....
23. 46	Driving while intoxicated.....	459
24. 69	Operating without operator's license.....	484
25. Miscellaneous.....	.....	277

PASSENGER CARS REGISTERED—1927

Counties	Total	Cities	Total
Algoma.....	2,248	Sault Ste. Marie.....	2,374
Brant.....	2,814	Brantford.....	3,338
Bruce.....	5,881	.....	5,881
Carleton.....	4,106	Ottawa.....	9,368
Dufferin.....	2,646	.....	13,474
Dundas.....	2,286	.....	2,646
Durham.....	3,321	.....	2,286
Elgin.....	4,781	.....	3,321
Essex.....	13,028	St. Thomas.....	2,454
Frontenac.....	2,740	Windsor.....	8,431
Glengarry.....	1,609	Kingston.....	2,201
Grenville.....	1,906	.....	4,941
Grey.....	6,338	.....	1,609
Haldimand.....	4,061	Owen Sound.....	1,525
Haliburton.....	459	.....	7,863
Halton.....	3,438	.....	4,061
Hastings.....	6,168	.....	459
Huron.....	6,948	Belleville.....	1,852
Kenora.....	639	.....	8,020
Kent.....	8,126	.....	6,948
Lambton.....	6,088	Chatham.....	2,578
Lanark.....	3,604	Sarnia.....	2,648
Leeds.....	4,446	.....	3,604
Lennox and Addington.....	2,563	.....	4,446
Lincoln.....	3,789	.....	2,563
Manitoulin.....	596	St. Catharines.....	2,823
Middlesex.....	8,433	.....	6,612
Muskoka.....	2,007	London.....	8,343
Nipissing.....	1,852	.....	16,776
Norfolk.....	4,136	North Bay.....	1,421
Northumberland.....	4,260	.....	3,273
Ontario.....	4,745	.....	4,136
Oxford.....	6,207	Oshawa.....	3,105
Parry Sound.....	2,185	Woodstock.....	2,315
Peel.....	3,868	.....	8,522
Perth.....	5,146	.....	2,185
Peterboro.....	2,793	Stratford.....	2,183
Prescott.....	1,690	Peterboro.....	2,555
Prince Edward.....	2,836	.....	5,348
Rainy River.....	1,198	.....	1,690
Renfrew.....	4,322	.....	2,836
Russell.....	1,266	.....	1,198
Simcoe.....	10,227	.....	4,322
Stormont.....	2,858	.....	1,266
Sudbury.....	1,995	.....	10,227
Thunder Bay.....	939	Fort William.....	2,089
.....	.....	Port Arthur.....	1,838
Temiskaming.....	3,612	.....	4,866
Victoria.....	4,245	.....	3,612
Waterloo.....	5,837	.....	4,245
Welland.....	6,729	Galt.....	1,756
.....	.....	Kitchener.....	3,256
Wellington.....	5,019	Niagara Falls.....	2,909
Wentworth.....	4,796	Welland.....	1,744
York.....	14,226	Guelph.....	2,223
Foreign.....	592	Hamilton.....	14,360
.....	.....	Toronto.....	74,566
.....	.....	.....	88,792
.....	.....	.....	592
.....	222,648	.....	164,255
.....	.....	.....	386,903

Horse-power			
4-cylinder less than 25 horse-power.....	298,478		
4-cylinder more than 25 and up to 35 horse-power.....	1,704		
4-cylinder more than 35 and up to 50 horse-power.....	69		
		300,251	
6-cylinder less than 25 horse-power.....	45,460		
6-cylinder more than 25 and up to 35 horse-power.....	35,853		
6-cylinder more than 35 and up to 50 horse-power.....	2,402		
6-cylinder more than 50 horse-power.....	330		
		84,045	
8-12-cylinder more than 25 and up to 35 horse-power.....	50		
8-12-cylinder more than 35 and up to 50 horse-power.....	2,293		
8-12-cylinder more than 50 horse-power.....	228		
		2,571	
Electric.....		36	
			386,903
Models			
Opened cars.....	197,192		
Closed cars.....	189,711		
			386,903
Registrations			
Originals.....	63,740		
Renewals.....	323,163		
			386,903

COMMERCIAL CARS REGISTERED—1927

Counties	Total	Cities	Total
Algoma.....	153	Sault Ste. Marie.....	202
Brant.....	250	Brantford.....	510
Bruce.....	273	.....	273
Carleton.....	389	Ottawa.....	1,412
Dufferin.....	133	.....	133
Dundas.....	131	.....	131
Durham.....	218	.....	218
Elgin.....	321	St. Thomas.....	221
Essex.....	1,886	Windsor.....	1,458
Frontenac.....	188	Kingston.....	283
Glengarry.....	70	.....	70
Grenville.....	166	.....	166
Grey.....	270	Owen Sound.....	139
Haldimand.....	303	.....	303
Haliburton.....	153	.....	153
Halton.....	352	.....	352
Hastings.....	402	Belleville.....	251
Huron.....	343	.....	343
Kenora.....	115	.....	115
Kent.....	572	Chatham.....	381
Lambton.....	402	Sarnia.....	217
Lanark.....	225	.....	225
Leeds.....	344	.....	344
Lennox and Addington.....	180	.....	180
Lincoln.....	650	St. Catharines.....	499
Manitowlin.....	39	.....	39
Middlesex.....	600	London.....	1,233
Muskoka.....	162	.....	162
Nipissing.....	108	North Bay.....	110
Norfolk.....	430	.....	430
Northumberland.....	419	.....	419
Ontario.....	375	Oshawa.....	352
Oxford.....	547	Woodstock.....	183
Parry Sound.....	149	.....	149
Peel.....	617	.....	617
Perth.....	284	Stratford.....	200
Peterboro.....	166	Peterboro.....	278
Prescott.....	187	.....	187
Prince Edward.....	266	.....	266
Rainy River.....	112	.....	112
Renfrew.....	259	.....	259
Russell.....	115	.....	115

COMMERCIAL CARS REGISTERED—1927—*Continued.*

Counties	Cities	Total
Simcoe.....	620	620
Stormont.....	254	254
Sudbury.....	259	259
Thunder Bay.....	118	118
Tenniskaming.....	432	432
Victoria.....	254	254
Waterloo.....	499	499
Welland.....	693	693
Wellington.....	306	306
Wentworth.....	956	956
York.....	2,077	2,077
Foreign.....	407	407
	20,199	23,243

Tires

Pneumatic.....	37,439
Solid.....	5,175
Municipal.....	397
Ontario Government.....	431
Dominion Government.....	431
	43,442

Gross Weights—Pneumatic Tires

Less than two tons.....	15,430
Of two tons and up to three tons.....	16,802
More than three tons and up to four tons.....	2,454
More than four tons and up to five tons.....	1,225
More than five tons and up to six tons.....	699
More than six tons and up to seven tons.....	301
More than seven tons and up to eight tons.....	274
More than eight tons and up to nine tons.....	198
More than nine tons and up to ten tons.....	56
	37,439

Gross Weights—Solid Tires

Less than two tons.....	165
Of two tons and up to three tons.....	1,599
More than three tons and up to four tons.....	254
More than four tons and up to five tons.....	409
More than five tons and up to six tons.....	607
More than six tons and up to seven tons.....	514
More than seven tons and up to eight tons.....	688
More than eight tons and up to nine tons.....	454
More than nine tons and up to ten tons.....	214
More than ten tons and up to eleven tons.....	69
More than eleven tons and up to twelve tons.....	202
	5,175
Municipal.....	397
Ontario Government.....	431
Dominion Government.....	431
	828
	43,442

TRAILER REGISTRATIONS—1927

Counties	Cities	Total
Algoma.....	2	7
Brant.....	14	35
Bruce.....	12	12
Carleton.....	8	45
Dufferin.....	.....	.....
Dundas.....	2	2
Durham.....	2	2
Elgin.....	49	56
Essex.....	126	168
Sault Ste. Marie.....	5	7
Brantford.....	21	35
Ottawa.....	37	45
St. Thomas.....	7	56
Windsor.....	42	168

TRAILER REGISTRATIONS—1927—*Continued*

Counties		Cities		Total
Frontenac.....	1	Kingston.....	8	9
Glengarry.....	1	.....	.....	1
Grenville.....	3	.....	.....	3
Grey.....	8	Owen Sound.....	5	13
Haldimand.....	42	.....	.....	42
Haliburton.....	.....	.....	.....	.....
Halton.....	17	.....	.....	17
Hastings.....	23	Belleville.....	17	40
Huron.....	88	.....	.....	88
Kenora.....	1	.....	.....	1
Kent.....	54	Chatham.....	16	70
Lambton.....	37	Sarnia.....	16	53
Lanark.....	18	.....	.....	18
Leeds.....	12	.....	.....	12
Lennox and Addington.....	11	.....	.....	11
Lincoln.....	9	Sr. Catharines.....	21	30
Manitoulin.....	.....	.....	.....	.....
Middlesex.....	67	London.....	44	111
Muskoka.....	4	.....	.....	4
Nipissing.....	3	North Bay.....	6	9
Norfolk.....	42	.....	.....	42
Northumberland.....	13	.....	.....	13
Ontario.....	12	Oshawa.....	44	56
Oxford.....	56	Woodstock.....	5	61
Parry Sound.....	1	.....	.....	1
Peel.....	23	.....	.....	23
Perth.....	36	Stratford.....	12	48
Peterboro.....	3	Peterboro.....	6	9
Prescott.....	.....	.....	.....	.....
Prince Edward.....	11	.....	.....	11
Rainy River.....	1	.....	.....	1
Renfrew.....	8	.....	.....	8
Russell.....	.....	.....	.....	.....
Simcoe.....	18	.....	.....	18
Stormont.....	5	.....	.....	5
Sudbury.....	1	.....	.....	1
Thunder Bay.....	1	Fort William.....	2	.....
.....	.....	Port Arthur.....	4	7
Temiskaming.....	2	.....	.....	2
Victoria.....	9	.....	.....	9
Waterloo.....	23	Galt.....	4	.....
Welland.....	18	Kitchener.....	19	46
.....	.....	Niagara Falls.....	14	.....
Wellington.....	21	Welland.....	12	44
Wentworth.....	19	Guelph.....	11	32
York.....	57	Hamilton.....	150	169
Foreign.....	28	Toronto.....	412	469
.....	.....	.....	.....	28
1,022		940		1,962

Trailer Gross Weights

One ton or less.....	1,301
More than one ton and up to two tons.....	191
More than two tons and up to three tons.....	122
More than three tons and up to four tons.....	107
More than four tons and up to five tons.....	123
More than five tons and up to six tons.....	40
More than six tons and up to seven tons.....	18
More than seven tons and up to eight tons.....	37
More than eight tons and up to nine tons.....	9
More than nine tons and up to ten tons.....	13
Municipal.....	1
1,962	

MOTORCYCLE REGISTRATIONS—1927

Counties		Cities		Total
Algoma.....	27	Sault Ste. Marie.....	7	34
Brant.....	22	Brantford.....	27	49
Bruce.....	9	.....	.....	9
Carleton.....	23	Ottawa.....	157	180
Dufferin.....	3	.....	.....	3
Dundas.....	20	.....	.....	20
Durham.....	25	.....	.....	25
Elgin.....	16	St. Thomas.....	4	20
Essex.....	33	Windsor.....	43	76
Frontenac.....	9	Kingston.....	26	35
Glengarry.....	7	.....	.....	7
Grenville.....	11	.....	.....	11
Grey.....	12	Owen Sound.....	6	18
Haldimand.....	8	.....	.....	8
Haliburton.....	1	.....	.....	1
Halton.....	34	.....	.....	34
Hastings.....	11	Belleville.....	14	25
Huron.....	8	.....	.....	8
Kenora.....	2	.....	.....	2
Kent.....	21	Chatham.....	15	36
Lambton.....	14	Sarnia.....	6	20
Lanark.....	14	.....	.....	14
Leeds.....	13	.....	.....	13
Lennox and Addington.....	5	.....	.....	5
Lincoln.....	18	St. Catharines.....	29	47
Manitoulin.....	.....	.....	.....	.....
Middlesex.....	29	London.....	92	121
Muskoka.....	8	.....	.....	8
Nipissing.....	11	North Bay.....	9	20
Norfolk.....	20	.....	.....	20
Northumberland.....	12	.....	.....	12
Ontario.....	32	Oshawa.....	44	76
Oxford.....	31	Woodstock.....	12	43
Parry Sound.....	4	.....	.....	4
Peel.....	25	.....	.....	25
Perth.....	34	Stratford.....	29	63
Peterboro.....	12	Peterboro.....	14	26
Prescott.....	9	.....	.....	9
Prince Edward.....	12	.....	.....	12
Rainy River.....	4	.....	.....	4
Renfrew.....	18	.....	.....	18
Russell.....	17	.....	.....	17
Simcoe.....	39	.....	.....	39
Stormont.....	20	.....	.....	20
Sudbury.....	.....	.....	.....	.....
Thunder Bay.....	10	Fort William.....	19	.....
.....	.....	Port Arthur.....	19	48
Temiskaming.....	32	.....	.....	32
Victoria.....	13	.....	.....	13
Waterloo.....	40	Galt.....	28	.....
.....	.....	Kitchener.....	42	110
Welland.....	56	Niagara Falls.....	43	.....
.....	.....	Welland.....	26	125
Wellington.....	16	Guelph.....	28	44
Wentworth.....	49	Hamilton.....	134	183
York.....	196	Toronto.....	1,170	1,366
Foreign.....	1	.....	.....	1
1,116		2,043		3,159

Motorcycle Registrations—1927

Original.....	434	
Renewal.....	2,725	
		3,159

Chauffeur Registrations—1927

Original.....	27,180	
Renewal.....	38,885	
		66,065

CHAUFFEUR REGISTRATIONS—1927

Counties		Cities		Total
Algoma.....	521	Sault Ste. Marie.....	376	897
Brant.....	339	Brantford.....	765	1,104
Bruce.....	714	.....	.....	714
Carleton.....	348	Ottawa.....	1,856	2,204
Dufferin.....	164	.....	.....	164
Dundas.....	300	.....	.....	300
Durham.....	382	.....	.....	382
Elgin.....	465	St. Thomas.....	362	827
Essex.....	2,241	Windsor.....	1,971	4,212
Frontenac.....	210	Kingston.....	497	707
Glengarry.....	147	.....	.....	147
Grenville.....	254	.....	.....	254
Grey.....	493	Owen Sound.....	389	882
Haldimand.....	513	.....	.....	513
Haliburton.....	67	.....	.....	67
Halton.....	735	.....	.....	735
Hastings.....	788	Belleville.....	373	1,161
Huron.....	701	.....	.....	701
Kenora.....	146	.....	.....	146
Kent.....	749	Chatham.....	662	1,411
Lambton.....	459	Sarnia.....	456	915
Lanark.....	443	.....	.....	443
Leeds.....	705	.....	.....	705
Lennox and Addington.....	309	.....	.....	309
Lincoln.....	641	St. Catharines.....	775	1,416
Manitoulin.....	15	.....	.....	15
Middlesex.....	695	London.....	2,282	2,977
Muskoka.....	425	.....	.....	425
Nipissing.....	542	North Bay.....	260	802
Norfolk.....	618	.....	.....	618
Northumberland.....	604	.....	.....	604
Ontario.....	643	Oshawa.....	761	1,404
Oxford.....	644	Woodstock.....	278	922
Parry Sound.....	331	.....	.....	331
Peel.....	495	.....	.....	495
Perth.....	443	Stratford.....	391	834
Peterboro.....	219	Peterboro.....	564	783
Prescott.....	299	.....	.....	299
Prince Edward.....	407	.....	.....	407
Rainy River.....	211	.....	.....	211
Renfrew.....	459	.....	.....	459
Russell.....	257	.....	.....	257
Simcoe.....	1,058	.....	.....	1,058
Stormont.....	494	.....	.....	494
Sudbury.....	74	.....	.....	74
Thunder Bay.....	70	Fort William.....	355	.....
.....	.....	Port Arthur.....	326	751
Temiskaming.....	1,135	.....	.....	1,135
Victoria.....	393	.....	.....	393
Waterloo.....	673	Galt.....	268	.....
.....	.....	Kitchener.....	577	1,518
Welland.....	1,234	Niagara Falls.....	750	.....
.....	.....	Welland.....	478	2,462
Wellington.....	421	Guelph.....	411	832
Wentworth.....	770	Hamilton.....	3,689	4,459
York.....	2,639	Toronto.....	16,949	19,588
Foreign.....	142	142
	29,244		36,821	66,065

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